FLUOR DANIEL ARCS TEAM

Members: Fluor Daniel, Inc.
I.T. Corporation
PEI Associates, Inc.
Life Systems, Inc.

Program Office:
12790 Merit Drive
Suite 200, LB 169
Dallas, TX 75251
Tel (214) 450-4100
Fax (214) 450-4101

September 15, 1994

FDI/ARCS # 3016

U.S. Environmental Protection Agency
Attn: Stacey Bennett, P.E. (6E-SH)
Work Assignment Manager
1445 Ross Avenue, Suite 1000
Dallas, Texas 75202

CONTRACT NO. 68-W9-0013
NARRATIVE REPORT / PRESCORE
NIPCO INC.
EPA ID NO. TXD062286729
ODESSA, ECTOR COUNTY, TEXAS
SITE INSPECTION PRIORITIZATION
WORK ASSIGNMENT NO. 33-6JZZ

Dear Ms. Bennett:

Attached is the Narrative Report and supporting documentation for the above-referenced site. We have also attached a 3.5" disk with an electronic copy of the Narrative Report and PREscore. With your approval, this submittal constitutes completion of our work for this site.

Should you have questions or require additional information, please contact either of the undersigned at (214) 450-4100.

Sincerely,

Mengistu Lemma
Mengistu Lemma
ARCS Technical Manager

Robert K. Franke
ARCS Deputy Program Manager

ML:RF:kp

Attachments

90069226

TI 1500 3 3

Introduction

Fluor Daniel, Inc. (FDI) was tasked by the U.S. Environmental Protection Agency (EPA) Region 6 to conduct Site Inspection Prioritization (SIP) activities at Nipco Inc. located in Odessa, Ector County, Texas (EPA ID No. TXD062286729). A phased approach was implemented for each site under this Work Assignment (WA). A preliminary site score was developed utilizing the PA-Score computer program. The PA-Score was completed using historical data provided by EPA Region 6. Additional non-sampling data were then collected and a PREscore was completed. This report summarizes the information which has been reviewed and collected for the Nipco Inc. site.

Site Description/Background Information

The Nipco Inc. site is located at 2104 W. 42nd Street in Odessa, Ector County, Texas. The site is approximately 1,000 feet west of West County Road on the west side of the city. Geographical coordinates of the site are 31°52'41" North latitude and 102°24'13" West longitude [11,2&4]. The site is an active metal plating and coating facility that uses nickel, tin and zinc [11,1]. The 2 acre site has been operating at the same location since 1978 [11,2&9]. The area surrounding the site was described as a mixture of industrial and residential by a company employee [13]. Nipco Inc. is registered with the Texas Department of Water Resources (TDWR) (currently known as Texas Natural Resources Conservation Commission (TNRCC)).

A Site Inspection was conducted at the facility by the EPA region 6 Field Investigation Team (FIT) in 1984 [11]. According to the FIT report, the operation was started in December 1978. The factory set up was in such a way that the wash and rinse water ran into an unlined sump at the north end of the process building. In 1979, TDWR inspectors found this set up unsatisfactory. In August 1979, the sump was dug out and a fiberglass tank was placed in it as a liner. TDWR has been maintaining a yearly inspection schedule at this site. The FIT recommended no further EPA action [11,8].

Waste Characteristics

The unlined sump that was used from 1978 to 1979 was considered the waste source at this site. A 1979 TDWR site inspection revealed that wash and rinse water from the Nipco plating operation was being discharged to the unlined sump on-site [11,9]. The wastewater was known to contain nickel, zinc, tin, and copper [11,19]. In August 1979, the sump received a fiberglass liner [11,9]. The wastewater is now discharged to the lined sump and recycled within the plating operation [11,9].

The volume of waste that was deposited in the unlined sump was estimated to be 2,000-3,000 gallons per month [11,5]. The unlined sump was used for approximately one year [11,9]. The waste quantity that was deposited in the sump before a liner was put in was calculated to be 36,000 gallons. The sump is not expected to be a waste source in its current condition.

Ground Water Migration Pathway

The Antlers Formation of the High Plains aquifer underlies Nipco Inc. [12,13-14]. This formation consists of loosely consolidated, fine to coarse grained quartz sandstone with interbedded green clay and gray to pink siltstone [12,14]. Well yields from the Antlers are relatively low due to the thin saturated thickness and low permeability of this formation [12,14]. A survey of a well drawing from this aquifer in neighboring Midland County indicated a depth to water of 63 feet with a saturated thickness of 7 feet [12,019]. No ground water sampling has been conducted near the site.

The City of Odessa gets its drinking water from the Colorado River Municipal Water District (CRMWD), which uses 26 to 30 wells. A total of one million gallons per day (gpd) from mid-May to the end of September is blended with 15 million gpd of surface water from E.V.Spence and J.B. Thomas Lakes [14]. The population of the City of Odessa is 93,760 [5,3]. Using the HRS Guidance Manual [2,275], the ground water population was calculated to be 5,850 (93,760/16=5,860). Since there are at least 26 ground water wells, each CRMWD well supplies approximately 225 (5,860/26=225) people. All these wells are located within the 4-mile target distance limit of the ground water pathway [5,13-15]. A total of 225 people are served by a well located within the 0 to 1/4 mile distance category. Within 1/4 to 1/2 mile, 225 people, within 1/2 to 1 mile, 2,025 people, within 1 to 2 miles, 2,475 people, and within 2 to 3 miles, 900 people are located [3].

Due to the fact that the ground water is blended with surface water and the fact that the source has been removed, threat to the ground water pathway is minimal.

Surface Water Migration Pathway

The nearest surface water is Monahans Draw, which is an intermittent stream located approximately 3.5 miles downstream (south) of the site [3,1]. Due to the absence of a surface water body in the area, threat to the surface water pathway is not likely.

Soil Exposure Pathway

There are no known areas of contaminated soil within 2 feet of the ground surface of the site. The wastewater contaminants were contained in the sump and the liquid level is estimated to have been greater than 2 feet below the sump [11,12]. No soil samples have been collected. Currently, the source is covered with a fiberglass tank. Due to the absence of surface contamination and the fact that the source has been covered, threat to the soil exposure pathway is not likely.

Air Migration Pathway

The known wastewater contaminants were all dissolved metals with essentially no vapor pressure at atmospheric conditions [1, Table 6-9; 11,19]. The threat to the environment via airborne migration is not expected.

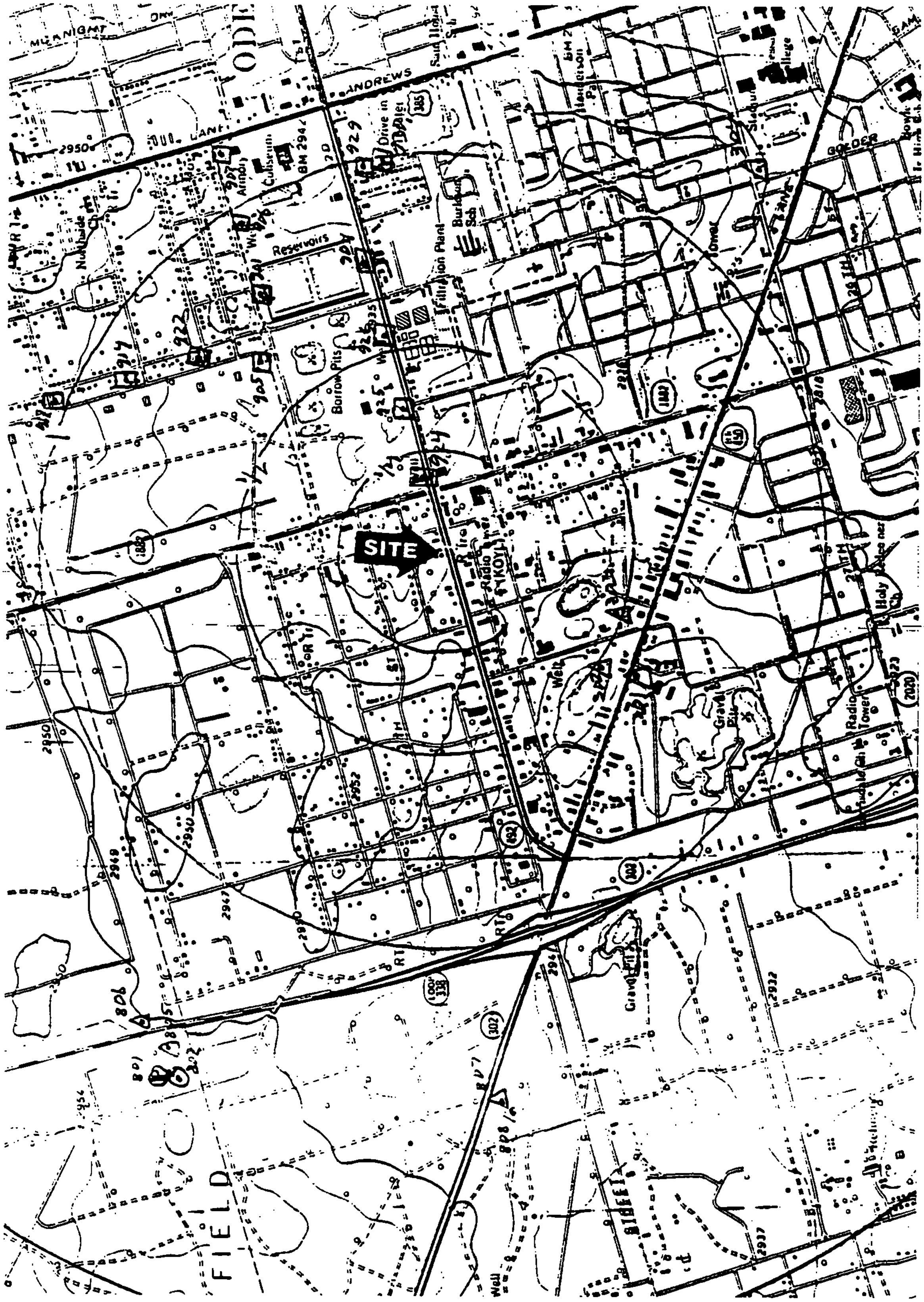
Due to the fact that the contaminants observed were metals dissolved in liquids and also the fact that the waste source has been covered, threat to the air pathway is not likely.

Summary

The Nipco Site is an active metal plating and coating facility that uses nickel, tin and zinc. The site has been in operation at the same location since 1978. The factory set-up was in such a way that the wash and rinse water ran into an unlined sump at the end of the process building. The TDWR inspectors found the set-up unsatisfactory and in August 1979, the sump was dug out and a fiberglass tank was placed in it. Threat to the ground water pathway is minimal due to the fact that the waste source has been removed and the drinking water in the area is a blended system with only a small fraction of the water coming from a ground water source. There is no surface water within 2 miles of the site, therefore, there is no threat to the surface water pathway. Threat to the soil exposure and air migration pathways is not likely due to the fact that the waste has been removed and the source has been covered.

FIGURE 1

SITE LOCATION MAP



U.S.G.S. 7.5 MIN. TOPOGRAPHIC MAP

FLUOR DANIEL

FIGURE 1

SITE LOCATION MAP

Nipco Inc.

CAD FILE No. FIG-1

References

1. U.S. Environmental Protection Agency, "Hazard Ranking System; Final Rule," Federal Register, Part II, 40 CFR 300, 14 December 1990.

2. U.S. Environmental Protection Agency, Hazard Ranking System Guidance Manual, November 1992.

3. U.S. Geological Survey, 7.5', 1:24,000 topographic maps of TX: Odessa NW, 1964 (photorev 1981); Odessa NE, 1964 (photorev 1981); Odessa SW, 1964 (photorev 1981); Odessa SE, 1964 (photorev 1981).

4. Record of Telephone Conversation, "Municipal Water Supply Information" From: Andy Kimbrough, Fluor Daniel, Inc., To: Matt Irvin, Asst Director of Utilities, Odessa Water Treatment Division, 31 August 1994, TXD062286729.

5. Texas Water Development Board, Ground Water Data System, "Records of Wells, Springs, and Test Holes," Ector County, database accessed August 1994.

6. Record of Telephone Conversation, From: David Terry, Texas Natural Resources and Conservation Commission, To: John W. Stumm, Fluor Daniel, Inc., 6 September 1994, TXD062286729.

7. Gale Research Company, "Climates of the States" Volume 2, Third Edition, (not dated).

8. Federal Emergency Management Agency (FEMA), National Flood Insurance Program, Flood Insurance Rate Map (FIRM) for Ector County, Texas and Incorporated Area: Panel 135 of 280, Map No. 48135C0135, 4 March 1991.

9. U.S. Department of Commerce, bureau of the Census, "County and City Data Book, 1988," Ector County, Texas.

10. U.S. Environmental Protection Agency, Geographical Exposure Modeling System (GEMS) database, compiled from U.S. Census Bureau 1990 data, accessed 21 June 1994.

11. U.S. Environmental Protection Agency, Potential Hazardous Waste Site, Site Name: Nipco Inc., from: Dave Peters, Chief - Hazardous Waste Section, to: Sam Nott, Chief - Enforcement Section, 20 January 1984.

12. Knowles, Nordstrom, and Klemt, Texas Department of Water Resources, "Evaluating the Ground-Water Resources of the High Plains of Texas," Volume 1, Report 288, May 1984, pp 2-4, 10, 13-14, 29-31, and Table 4.

13. Record of Telephone Conversation, From: Mengistu Lemma, Fluor Daniel, Inc., To: Andy Biasco, Nipco Inc., Status/Number of Employees at the Nipco Site, 13 September 1994.

14. Record of Telephone Conversation, From: Allan Seils, SSDAT, To: Rod Lewis, CRMWD, Ground Water Well Population Information, February 1992.

REFERENCE 1

U.S. Environmental Protection Agency, "Hazard Ranking System; Final Rule," Federal Register, Part II, 40 CFR 300, 14 December 1990.

12-14-90
Vol. 55 No. 241

federal register

Friday
December 14, 1990

Book 2

United States
Government
Printing Office
SUPERINTENDENT
OF DOCUMENTS
Washington, DC 20402

OFFICIAL BUSINESS
Penalty for private use, $300

SECOND CLASS NEWSPAPER

Postage and Fees Paid
U.S. Government Printing Office
(ISSN 0097-6326)

REFERENCE 2

U.S. Environmental Protection Agency, Hazard Ranking System Guidance Manual, November 1992.

EPA540-R-92-026
OSWER Directive 9345.1-07
November 1992

The Hazard Ranking System Guidance Manual

Interim Final

Hazardous Site Evaluation Division
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, DC 20460

REFERENCE 3

U.S. Geological Survey, 7.5', 1:24,000 topographic maps of TX: Odessa NW, 1964 (photorev 1981); Odessa NE, 1964 (photorev 1981); Odessa SW, 1964 (photorev 1981); Odessa SE, 1964 (photorev 1981).

TG

This Document Contained Material Which Was Not Filmed/Scanned

Title United States Department Of the Interior Geological Survey Odessa NW Quadrangle Texas-Ector Co.
(Oversized Map)

Please Refer to the File in Superfund Records Center


UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ODESSA NW QUADRANGLE
TEXAS–ECTOR CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
ODESSA NE QUADRANGLE
TEXAS
7.5 MINUTE SERIES (TOPOGRAPHIC)
NORTH COWDEN OIL FIELD
JOHNSON OIL FIELD
FOSTER OIL FIELD
ODESSA
Mapped, edited, and published by the Geological Survey
Control by USGS and NOS/NOAA
Topography by photogrammetric methods from aerial photographs taken 1963. Field checked 1964
Polyconic projection. 1927 North American Datum
10,000-foot grid based on Texas coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 13, shown in blue
The difference between 1927 North American Datum and North American Datum of 1983 (NAD 83) for 7.5 minute intersections is given in USGS Bulletin 1875. The NAD 83 is shown by dashed corner ticks
Fine red dashed lines indicate selected fence lines
UTM GRID AND 1981 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET
(CLARK BROTHERS RANCH)
5547 III NW
SCALE 1:24 000
CONTOUR INTERVAL 5 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929
THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST
QUADRANGLE LOCATION
Revisions shown in purple compiled from aerial photographs taken 1974 and 1979. Map edited 1981
This information not field checked
Purple tint indicates extension of urban area
3102–432
ROAD CLASSIFICATION
Primary highway, hard surface
Light-duty road, hard or improved surface
Secondary highway, hard surface
Unimproved road
Interstate Route
U. S. Route
State Route
ALLSTATE MAP MAKERS
DIV. MAPSCO, INC.
1201 HENDERSON AT WEST FRWY.
FORT WORTH, 76102 817/332-1111
ODESSA SW, TEX.
31102-G4-TF-024
1964
PHOTOREVISED 1981
DMA 5547 IV SW–SERIES V882
(SOUTH COWDEN RANCH)
5547 III NE
Red tint indicates area in which only landmark buildings are shown
To place on the predicted North American Datum 1983 move the projection lines 11 meters south and 40 meters east as shown by dashed corner ticks
ODESSA SE, TEX.
N3145–W10215/7.5
1964
PHOTOREVISED 1981
DMA 5547 IV SE–SERIES V882
3102–431
NIPLO INL.
TOPOGRAPHIC MAPS
03-001

REFERENCE 4

Record of Telephone Conversation, "Municipal Water Supply Information" From: Andy Kimbrough, Fluor Daniel, Inc., To: Matt Irvin, Asst Director of Utilities, Odessa Water Treatment Division, 31 August 1994, TXD062286729.

Fluor Daniel Environmental Services
Record of Telephone Conversation

ARCS

Nipco Inc. (CERCLIS #TXD062286729)
August 31, 1994

to:	Water Department for the City of Odessa Texas	phone:	915-335-3204
from:	Andy Kimbrough	phone:	714-975-6648
purpose:	Municipal Water Supply Information		

I number listed above is for billing information for the city's water department. I was forwarded to the "management" department to obtain the number of customers served by city water. I spoke with Janet in that department who informed me that the number of customers varies between 28,000 and 30,000 depending on the month. This is the number of residences, companies, or other organizations which are billed for water usage by the city.

I was forwarded to Matt Irvin, Assistant Director of Utilities, Water Treatment Division (FAX: 915-367-1081) concerning the number of customers served by wells located in Odessa. Water is purchased from the Colorado River Municipal Water District which manages water coming from independent supply districts in that part of Texas. The water wells located in Odessa are not operated by the city. These wells are operated by one of the above mentioned independent water districts. Matt states that most drinking water comes from Lake Spence and lakes around San Angelo. These lakes are all well outside the four mile radius of the site. Ground water is used infrequently during the year. When ground water is used, it comes from the Odessa wells and some other water districts operating wells near Monahans (~ 30 miles west of Odessa). Matt will provide the specific districts/sources providing water to Odessa and an annualized estimate of the quantity of water provided by each source. Well-by-well data is not available from the Odessa water department. This data was promised by Tuesday of next week.

Andy Kimbrough 31-AUG-94
Andy Kimbrough

04-001

REFERENCE 5

Texas Water Development Board, Ground Water Data System, "Records of Wells, Springs, and Test Holes," Ector County, database accessed August 1994.

THIS DOCUMENT CONTAINED CONFIDENTIAL INFORMATION WHICH WAS REFILED TO THE PRIVACY ACT/HEALTH CONFIDENTIAL (PC) PHASE/ACTIVITY

DOC # T67290038

DATE:

TITLE: Reference 5: TX Water Development Board, Ground Water Data System, "Record of Wells, Springs, and Test Holes," Ector County, Database accessed August 1994.

REFERENCE 6

Record of Telephone Conversation, From: David Terry, Texas Natural Resources and Conservation Commission, To: John W. Stumm, Fluor Daniel, Inc., 6 September 1994, TXD062286729.

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM:	Mr. David Terry	DATE:	6 September, 1994
LOCATION:	Texas Natural Resources and Conservation Commission	TIME:	14:40 p.m. Pacific Daylight Time
TO:	John W. STUMM	P.O. NO.	06/683440/77 Nipco, Inc. Site
LOCATION:	Irvine, CA M/S 552M	OTHER REF.	(512) 239 - 4755

Mr. David Terry states that there are no well head protection programs presently that cover the city of Odessa or the County of Ector.

John Stumm. 9/6/94

03-001

FORM G252-0-1 (Rev. 12-88) Ami Pro

REFERENCE 7

Gale Research Company, "Climates of the States" Volume 2, Third Edition, (not dated).

CLIMATES OF THE STATES

National Oceanic and Atmospheric Administration
Narrative Summaries, Tables, and Maps
for Each State
with
Overview of State Climatologist Programs

Third Edition

New Material by
James A. Ruffner

Volume 2
New York — Wyoming
Puerto Rico and Virgin Islands
Pacific Islands
Atlas of State Climates
Hurricane Data
The State Climatologist Program 1954-1973
Guide to Current Information Sources
Appendix

GALE RESEARCH COMPANY • BOOK TOWER • DETROIT, MICHIGAN 48226

CLIMATOLOGICAL SUMMARY

MEMPHIS, TX (# 415821)   1951-80   34° 44' N   100° 33' W   2100 FT.

	TEMPERATURE (F): MEANS: * DAILY MAXIMUM	* DAILY MINIMUM	* MONTHLY	EXTREMES: RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	MEAN NUMBER OF DAYS: MAX 90 AND ABOVE	MAX 32 AND BELOW	MIN 32 AND BELOW	MIN 0 AND BELOW	DEGREE DAYS: * HEATING BASE 65	* COOLING BASE 65	PRECIPITATION TOTALS (INCHES): * MEAN	* GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	SNOW: MEAN	MAXIMUM MONTHLY	YEAR	MEAN NUMBER OF DAYS: .10 OR MORE	.50 OR MORE	1.00 OR MORE
JAN	52.4	24.5	38.4	84	52	27	-4+	59	5	0	3	25	0	825	0	.53	2.60	68	1.70	68	22	1.5	11.0	60	1	0	0
FEB	57.7	28.7	43.2	92+	79	15	-2+	51	2	0	2	19	0	610	0	.72	1.88	64	1.30	61	21	3.2	12.0	68	2	0	0
MAR	65.1	35.0	50.1	99+	71	28	4+	60	3	0	0	12	0	474	12	1.07	5.25	73	2.60	74	10	1.0	9.0	70	2	1	0
APR	75.8	46.3	61.1	103+	59	26	25+	75	4	4	0	1	0	173	56	1.96	6.07	57	2.60	57	28	.0	.0	0	3	1	1
MAY	83.2	55.7	69.5	108+	53	24	32+	54	4	9	0	0	0	43	182	3.99	9.35	78	4.00	78	28	.0	.0	0	5	3	1
JUN	91.8	65.1	78.5	115+	53	15	46+	64	1	19	0	0	0	0	405	3.25	13.26	60	8.80	60	07	.0	.0	0	4	2	1
JUL	96.5	69.4	83.0	110+	64	28	54	52	9	27	0	0	0	0	558	1.93	6.24	58	1.95	61	14	.0	.0	0	3	1	1
AUG	95.3	67.7	81.5	112+	64	6	52+	62	27	25	0	0	0	0	512	1.82	7.26	66	1.87	66	22	.0	.0	0	3	[illegible]	1
SEP	87.2	60.0	73.6	110+	52	1	39+	67	29	14	0	0	0	12	270	2.19	7.10	78	2.75	66	15	.0	.0	0	3	2	1
OCT	77.1	47.8	62.5	100+	77	1	26+	80	31	4	0	1	0	145	67	1.64	6.77	60	2.42	57	13	.0	.0	0	3	1	0
NOV	63.1	35.4	49.3	91+	52	2	12+	59	17	0	0	11	0	471	0	.67	2.62	64	1.04	62	26	1.2	10.5	72	1	0	0
DEC	56.0	27.9	42.0	88+	55	25	6+	72	7	0	1	23	0	713	0	.57	4.35	59	1.25	59	17	1.5	17.0	60	1	0	0
YEAR	75.1	47.0	61.1	115	JUN 53	15	-4	JAN 59	5	102	6	92	0	3466	2062	20.34	13.26	JUN 60	8.80	JUN 60	07	8.4	17.0	DEC 60	31	12	6

MEXIA, TX (# 415869)   1951-80   31° 41' N   96° 29' W   529 FT.

	TEMPERATURE (F): MEANS: * DAILY MAXIMUM	* DAILY MINIMUM	* MONTHLY	EXTREMES: RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	MEAN NUMBER OF DAYS: MAX 90 AND ABOVE	MAX 32 AND BELOW	MIN 32 AND BELOW	MIN 0 AND BELOW	DEGREE DAYS: * HEATING BASE 65	* COOLING BASE 65	PRECIPITATION TOTALS (INCHES): * MEAN	* GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	SNOW: MEAN	MAXIMUM MONTHLY	YEAR	MEAN NUMBER OF DAYS: .10 OR MORE	.50 OR MORE	1.00 OR MORE
JAN	55.8	34.4	45.1	83+	71	31	9+	63	24	0	1	14	0	617	0	2.66	6.48	68	3.80	65	22	.7	4.0	64	5	2	1
FEB	60.5	38.1	49.3	89+	80	21	0+	51	3	0	1	8	0	447	7	2.78	4.54	75	2.00	53	11	.5	4.5	66	5	2	1
MAR	68.4	45.2	56.8	91+	71	29	13+	80	2	0	0	3	0	285	31	2.93	6.81	65	5.95	65	30	.2	2.0	54	5	2	1
APR	76.4	55.0	65.7	96+	63	10	33+	75	3	0	0	0	0	79	100	4.37	15.33	57	5.71	66	18	.0	.0	0	6	3	2
MAY	82.8	62.6	72.7	97+	63	11	41	54	4	4	0	0	0	0	244	4.72	12.70	65	5.28	75	12	.0	.0	0	6	3	2
JUN	90.4	69.6	80.0	107+	80	28	52+	70	3	19	0	0	0	0	450	3.15	12.38	73	3.90	73	04	.0	.0	0	4	2	1
JUL	95.0	73.1	84.1	110+	54	26	59+	67	15	26	0	0	0	0	592	1.61	5.20	59	2.46	72	05	.0	.0	0	3	1	0
AUG	95.9	72.3	84.1	108+	80	23	58+	67	13	28	0	0	0	0	532	2.11	9.94	66	6.60	66	12	.0	.0	0	3	1	1
SEP	89.2	67.0	78.1	105+	56	20	48+	72	30	17	0	0	0	0	393	4.57	12.51	74	4.87	77	10	.0	.0	0	5	3	2
OCT	79.8	55.9	67.9	98+	53	1	32+	57	27	4	0	0	0	59	149	3.54	9.62	73	6.61	76	05	.0	.0	0	4	2	1
NOV	67.3	44.8	56.1	91+	80	10	20+	76	30	0	0	3	0	285	18	3.01	7.73	52	3.10	71	18	.1	2.3	76	5	2	1
DEC	59.7	37.4	48.6	84+	55	25	12	63	23	0	0	9	0	508	0	2.83	8.52	60	3.00	76	11	.2	4.5	63	4	2	1
YEAR	76.8	54.6	65.7	110	JUL 54	26	0	FEB 51	3	98	[illegible]	37	0	2280	2576	38.28	15.33	APR 57	6.61	OCT 76	05	1.7	4.5	FEB 66	55	25	14

MIDLAND, TX (# 415891)   1951-80   32° 01' N   102° 01' W   2740 FT.

	TEMPERATURE (F): MEANS: * DAILY MAXIMUM	* DAILY MINIMUM	* MONTHLY	EXTREMES: RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	MEAN NUMBER OF DAYS: MAX 90 AND ABOVE	MAX 32 AND BELOW	MIN 32 AND BELOW	MIN 0 AND BELOW	DEGREE DAYS: * HEATING BASE 65	* COOLING BASE 65	PRECIPITATION TOTALS (INCHES): * MEAN	* GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	SNOW: MEAN	MAXIMUM MONTHLY	YEAR	MEAN NUMBER OF DAYS: .10 OR MORE	.50 OR MORE	1.00 OR MORE
JAN	59.4	29.2	44.3	88+	53	14	-12+	62	11	0	1	20	0	642	0	.52	1.96	68	1.08	68	21	1.3	7.0	74	1	0	0
FEB	64.1	32.9	48.5	88+	57	9	1+	51	2	0	0	14	0	462	0	.51	1.60	65	1.21	65	17	1.2	8.2	56	1	0	0
MAR	72.1	39.7	55.9	97+	63	29	10+	62	1	0	0	7	0	306	23	.49	4.12	70	2.86	70	06	.4	6.2	58	1	0	0
APR	80.8	49.8	65.3	100+	65	21	22+	73	9	4	0	1	0	86	95	.74	2.40	66	1.41	54	12	.0	.0	0	2	0	0
MAY	87.5	58.2	72.9	108+	53	22	34	51	1	13	0	0	0	6	251	1.97	7.57	68	7.20	68	09	.0	.0	0	3	1	1
JUN	93.9	66.3	80.1	110+	53	23	45+	64	1	24	0	0	0	0	453	1.21	4.37	61	2.67	61	15	.0	.0	0	2	1	0
JUL	94.8	68.7	91.7	107+	54	26	56+	71	30	27	0	0	0	0	518	2.11	7.69	61	5.00	61	22	.0	.0	0	3	1	1
AUG	93.8	67.6	80.7	107+	69	17	53+	51	22	26	0	0	0	0	487	1.70	6.37	72	2.19	72	13	.0	.0	0	3	1	0
SEP	87.6	61.3	74.5	106	52	1	39+	71	20	14	0	0	0	6	291	2.77	13.59	80	5.81	70	01	.0	0	0	3	2	1
OCT	79.2	50.1	64.7	100	77	1	27+	80	29	3	0	0	0	88	79	1.15	6.04	74	2.27	74	13	.0	.0	0	2	1	0
NOV	67.0	38.3	52.7	88+	80	9	11+	76	14	0	0	8	0	373	0	.55	2.30	68	1.28	75	01	.7	10.0	80	1	0	0
DEC	61.0	31.4	46.2	86+	54	4	8+	51	21	0	0	19	0	583	0	.41	2.27	79	1.00	79	12	5	6.1	60	1	0	0
YEAR	78.4	49.5	64.0	110	JUN 53	23	-12	JAN 62	11	111	1	69	0	2552	2197	14.13	13.59	SEP 80	7.20	MAY 68	09	4.1	10.0	NOV 80	23	7	3

*FROM 1951-80 NORMALS   # ESTIMATED VALUE BASED ON DATA FROM SURROUNDING STATIONS   + ALSO ON EARLIER DATES.

97-992

REFERENCE 8

Federal Emergency Management Agency (FEMA), National Flood Insurance Program, Flood Insurance Rate Map (FIRM) for Ector County, Texas and Incorporated Area: Panel 135 of 280, Map No. 48135C0135, 4 March 1991.

This Document Contained Material Which Was Not Filmed/Scanned

Title Firm Flood Insurance Rate Map Ector County, Texas and Incorporated Area (Oversized Map)

Please Refer to the File in Superfund Records Center

JOINS PANEL 0100
JOINS PANEL 0170
JOINS PANEL 0130
JOINS PANEL 0140
ZONE X
ZONE A
ZONE AE
Ector County
Unincorporated Areas
480796
City of Odessa
480206
ECTOR COUNTY
CITY OF ODESSA
Muskingum Draw
LIMIT OF DETAILED STUDY
LEGEND
SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD
FLOODWAY AREAS IN ZONE AE
OTHER FLOOD AREAS
OTHER AREAS
UNDEVELOPED COASTAL BARRIERS
NOTES
MAP REPOSITORY
Refer to Repository Listing on Map Index
EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP
MARCH 4, 1991
APPROXIMATE SCALE
800 0 800 FEET
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
ECTOR COUNTY, TEXAS AND INCORPORATED AREAS
PANEL 135 OF 280
(SEE MAP INDEX FOR PANELS NOT PRINTED)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
ODESSA, CITY OF 480206 0135 C
UNINCORPORATED AREAS 480796 0135 C
PANEL LOCATION
MAP NUMBER
48135C0135 C
EFFECTIVE DATE:
MARCH 4, 1991
Federal Emergency Management Agency

08-001

REFERENCE 9

U.S. Department of Commerce, bureau of the Census, "County and City Data Book, 1988," Ector County, Texas.

A Statistical Abstract Supplement

County and City Data Book

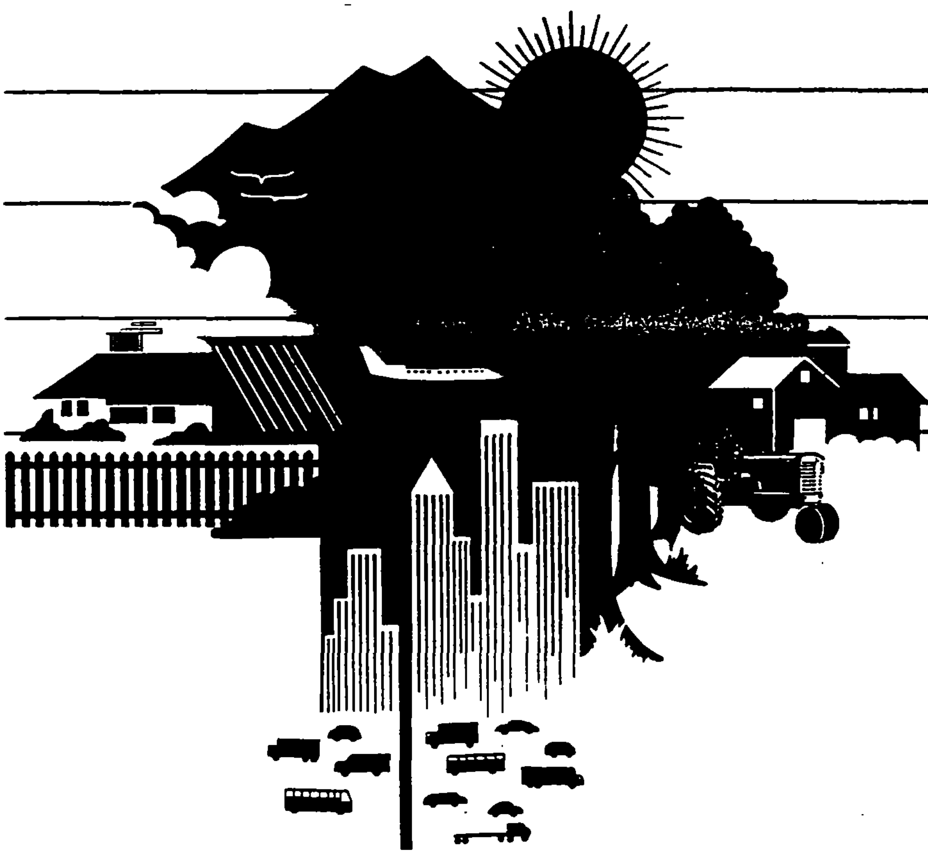
1988

States

Counties

Cities of 25,000 or More

Places of 2,500 or More



U.S. Department of Commerce

C. William Verity,
Secretary
Donna C. Tuttle,
Deputy Secretary
Robert Ortner,
Under Secretary
for Economic Affairs

BUREAU OF THE CENSUS
John G. Keane,
Director

County	Population characteristics—Con.												Households					
	1984—Con.									1980			1985			1980		
	Percent—									Percent—							Percent—	
	Under 5 years	5 to 14 years	15 to 24 years	25 to 34 years	35 to 44 years	45 to 54 years	55 to 64 years	65 to 74 years	75 years and over	American Indian, Eskimo, and Aleut	Asian and Pacific Islander	Hispanic[1]	Number	Percent change, 1980-1985	Persons per household	Number	Female family householder[2]	One-person[3]
	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
TEXAS	8.7	15.6	17.8	18.6	13.0	9.0	8.0	5.5	3.7	.28	.85	20.98	5 796 000	17.6	2.76	4 929 267	9.5	21.7
Anderson	7.4	13.6	18.9	19.2	11.0	8.1	8.5	7.6	5.8	.23	.22	4.68	14 300	15.8	2.70	12 386	9.3	22.5
Andrews	S	S	S	S	S	S	S	S	S	.47	.94	21.80	5 300	19.9	3.08	4 423	6.0	15.5
Angelina	9.4	16.8	16.4	15.5	12.5	9.2	8.1	7.3	4.8	.13	.21	6.31	23 700	8.7	2.84	21 781	8.5	19.4
Aransas	S	S	S	S	S	S	S	S	S	.34	1.68	19.09	6 500	26.7	2.69	5 168	5.6	19.0
Archer	S	S	S	S	S	S	S	S	S	.52	.08	1.90	2 600	5.2	2.78	2 644	5.0	19.6
Armstrong	S	S	S	S	S	S	S	S	S	.30	.35	2.66	700	-8.7	2.67	750	2.4	22.1
Atascosa	9.2	18.5	16.5	14.1	12.9	9.2	8.4	6.8	4.5	.19	.22	47.83	9 000	12.5	3.11	8 036	7.7	19.0
Austin	6.5	15.5	12.3	14.7	14.1	8.7	8.8	9.3	8.1	.23	.08	5.58	7 300	13.4	2.80	6 434	6.6	23.5
Bailey	S	S	S	S	S	S	S	S	S	.06	.11	33.91	2 700	-.2	3.06	2 681	5.5	17.2
Bandera	S	S	S	S	S	S	S	S	S	.28	.14	12.18	3 600	28.3	2.48	2 802	5.5	25.1
Bastrop	9.2	14.6	15.6	17.1	11.6	9.1	9.8	7.5	5.6	.25	.11	13.76	12 200	39.8	2.75	8 719	8.4	22.1
Baylor	S	S	S	S	S	S	S	S	S	.28	.14	6.22	2 100	2.4	2.25	2 027	5.2	27.1
Bee	9.5	17.7	18.0	17.6	11.3	8.8	7.3	5.6	4.3	.35	1.08	45.77	8 700	6.0	3.00	8 181	8.9	17.4
Bell	6.7	13.3	24.6	18.1	12.0	8.7	8.6	4.8	3.3	.37	2.12	11.02	63 700	21.0	2.59	52 661	8.2	19.3
Bexar	8.9	16.7	18.0	18.0	12.3	9.1	8.3	5.2	3.5	.24	.76	46.61	378 300	18.0	2.92	320 639	12.5	20.6
Blanco	S	S	S	S	S	S	S	S	S	.06	.04	9.23	2 200	20.0	2.53	1 825	5.6	24.9
Borden	S	S	S	S	S	S	S	S	S	.47	-	14.78	300	-1.3	2.97	299	3.7	14.0
Bosque	S	S	S	S	S	S	S	S	S	.28	.25	5.23	5 900	6.7	2.34	5 513	5.1	27.7
Bowie	7.7	15.3	15.0	15.7	13.1	10.0	9.9	7.8	5.6	.23	.28	1.32	30 200	9.9	2.63	27 449	11.2	22.9
Brazoria	9.5	16.2	17.3	20.5	14.1	9.1	6.6	4.2	2.3	.30	.45	13.37	59 900	11.1	2.99	53 907	6.1	15.6
Brazos	7.9	11.3	38.5	17.4	10.4	5.8	4.8	3.4	2.5	.18	1.17	10.10	43 300	33.2	2.57	32 488	6.6	22.9
Brewster	S	S	S	S	S	S	S	S	S	.28	.45	43.07	2 900	5.8	2.60	2 694	8.3	27.5
Briscoe	S	S	S	S	S	S	S	S	S	.16	.08	16.21	900	-9.0	2.59	967	5.0	22.6
Brooks	S	S	S	S	S	S	S	S	S	.06	.04	85.99	2 900	10.3	3.16	2 614	14.6	16.8
Brown	7.7	14.7	16.7	14.1	11.6	8.7	9.6	9.5	7.4	.18	.21	7.89	13 100	6.3	2.54	12 308	7.7	25.0
Burleson	S	S	S	S	S	S	S	S	S	.08	.02	10.35	5 300	18.0	2.79	4 459	8.9	23.5
Burnet	6.1	14.7	10.9	11.6	10.9	9.6	14.7	13.2	8.2	.21	.24	7.07	8 800	26.7	2.57	6 951	5.5	20.7
Caldwell	7.2	13.3	28.7	13.5	9.8	8.0	6.8	6.6	6.2	.24	.71	32.96	9 000	22.4	2.73	7 381	8.8	22.7
Calhoun	8.5	17.1	16.4	14.6	14.0	11.0	10.3	5.2	2.9	.24	.75	33.98	7 500	15.7	2.86	6 469	6.8	17.5
Callahan	S	S	S	S	S	S	S	S	S	.19	.45	3.38	4 800	15.6	2.57	4 150	5.7	21.1
Cameron	9.4	20.4	16.9	15.3	11.3	8.8	8.8	5.7	3.4	.14	.16	77.08	73 900	26.6	3.37	58 418	12.7	15.0
Camp	S	S	S	S	S	S	S	S	S	.14	.09	1.35	3 700	8.7	2.68	3 404	8.7	23.2
Carson	S	S	S	S	S	S	S	S	S	.70	.27	3.96	2 500	2.9	2.72	2 395	3.8	20.6
Cass	7.9	16.7	13.3	13.1	13.8	9.4	9.9	9.4	6.6	.17	.05	1.14	10 900	4.0	2.75	10 515	9.2	21.3
Castro	S	S	S	S	S	S	S	S	S	.28	.12	38.57	3 100	-2.6	3.38	3 138	5.3	15.6
Chambers	S	S	S	S	S	S	S	S	S	.48	.11	3.38	6 600	5.8	2.96	6 248	6.1	16.6
Cherokee	7.1	15.1	14.2	13.6	12.5	9.5	10.4	10.1	7.4	.17	.34	3.39	14 500	6.4	2.63	13 627	9.0	23.8
Childress	S	S	S	S	S	S	S	S	S	.24	.24	9.83	2 600	-6.4	2.44	2 776	6.7	26.9
Clay	S	S	S	S	S	S	S	S	S	.35	.04	.87	3 700	1.3	2.62	3 607	5.9	21.1
Cochran	S	S	S	S	S	S	S	S	S	.08	.04	34.80	1 400	-4.4	3.22	1 515	6.9	16.4
Coke	S	S	S	S	S	S	S	S	S	.63	.44	12.42	1 400	12.2	2.42	1 257	5.3	23.2
Coleman	S	S	S	S	S	S	S	S	S	.23	.23	9.05	4 300	2.5	2.35	4 243	7.2	27.6
Collin	9.2	18.4	13.8	20.6	18.9	8.2	5.0	3.4	2.5	.31	.71	4.97	65 000	40.2	2.98	46 373	6.7	13.6
Collingsworth	S	S	S	S	S	S	S	S	S	.73	.17	11.92	1 600	-13.4	2.54	1 790	6.7	26.8
Colorado	8.5	15.3	12.7	13.8	12.0	9.8	10.4	9.6	7.9	.11	.10	14.11	7 300	5.4	2.71	6 938	8.2	24.6
Comal	6.5	15.1	13.0	15.7	13.5	10.1	11.4	9.0	5.7	.22	.09	23.95	16 800	29.5	2.74	12 958	6.4	18.1
Comanche	S	S	S	S	S	S	S	S	S	.14	.09	10.64	5 200	4.2	2.44	4 973	6.0	24.6
Concho	S	S	S	S	S	S	S	S	S	.10	.07	27.65	1 000	-5.9	2.70	1 091	5.5	23.8
Cooke	9.6	14.1	17.7	13.4	12.3	8.8	9.1	8.8	6.2	.53	.27	2.02	10 500	4.7	2.70	10 078	6.8	22.2
Coryell	8.1	14.9	30.4	18.5	11.6	6.0	4.8	3.1	2.7	.60	2.22	8.21	14 800	5.1	3.04	14 090	6.6	14.0
Cottle	S	S	S	S	S	S	S	S	S	.07	.20	14.25	1 000	-12.8	2.57	1 164	5.6	25.9
Crane	S	S	S	S	S	S	S	S	S	.15	.28	24.52	1 700	9.2	2.90	1 552	5.1	17.0
Crockett	S	S	S	S	S	S	S	S	S	.43	.07	44.55	1 600	5.3	2.83	1 558	6.0	19.8
Crosby	S	S	S	S	S	S	S	S	S	.06	.05	37.01	2 900	-.3	2.84	2 920	6.0	19.6
Culberson	S	S	S	S	S	S	S	S	S	.18	.24	63.38	1 100	9.5	3.11	987	9.1	14.3
Dallam	S	S	S	S	S	S	S	S	S	.56	.43	16.69	2 400	1.8	2.73	2 386	6.2	24.7
Dallas	8.1	14.2	19.0	21.1	13.5	8.9	7.5	4.6	3.0	.42	.97	9.93	689 600	19.4	2.57	577 701	11.1	25.2
Dawson	S	S	S	S	S	S	S	S	S	.07	.22	37.68	5 700	4.8	2.81	5 483	6.7	19.2
Deaf Smith	12.0	19.1	15.7	15.1	12.2	8.5	8.5	5.1	3.8	.17	.17	40.67	6 300	-3.2	3.18	6 487	7.0	15.1
Delta	S	S	S	S	S	S	S	S	S	.45	.08	.41	1 900	-1.8	2.44	1 932	7.4	28.0
Denton	9.1	14.9	18.9	22.0	16.0	7.9	5.2	3.6	2.5	.41	1.05	4.47	66 700	35.7	2.72	49 134	6.4	19.0
De Witt	7.3	15.9	12.0	14.0	10.3	9.8	10.4	10.9	9.4	.05	.04	23.08	7 400	4.7	2.65	7 058	8.6	26.2
Dickens	S	S	S	S	S	S	S	S	S	.08	.08	16.59	1 200	-15.2	2.65	1 369	5.3	26.4
Dimmit	S	S	S	S	S	S	S	S	S	.18	.12	77.81	3 400	6.9	3.47	3 135	10.6	14.6
Donley	S	S	S	S	S	S	S	S	S	.20	.05	3.68	1 600	-2.6	2.45	1 608	4.9	24.7
Duval	S	S	S	S	S	S	S	S	S	.10	.02	85.78	3 900	5.4	3.35	3 738	12.1	17.3
Eastland	6.5	14.2	14.8	13.3	10.1	10.0	10.2	10.9	10.0	.24	.17	4.77	8 000	3.5	2.43	7 730	6.3	28.4
Ector	10.8	15.7	18.6	20.0	11.8	9.0	7.2	4.4	2.4	.46	.38	21.52	46 900	15.9	2.84	40 450	7.5	19.1
Edwards	S	S	S	S	S	S	S	S	S	.59	.10	47.57	700	4.7	2.83	697	7.6	21.8
Ellis	8.5	16.6	15.3	15.7	14.2	9.3	8.3	6.7	5.4	.22	.12	9.66	25 000	25.6	2.90	19 866	8.2	18.0
El Paso	9.7	18.9	18.3	18.7	12.3	9.3	7.8	4.3	2.6	.32	.84	61.89	164 100	16.5	3.26	140 806	12.8	16.2
Erath	7.5	10.5	21.2	13.6	10.6	9.4	9.4	9.2	8.6	.15	.31	4.08	9 900	14.4	2.36	8 699	5.7	25.3

[1]Hispanic persons may be of any race. [2]No spouse present. [3]Householder living alone.

09—002

Table C. Cities — **Area and Population**

[Cities include incorporated places with 1990 population of 25,000 or more in all States except Hawaii which has no incorporated places recognized by the Bureau of the Census. For Hawaii, census designated places (CDP's) with a 1990 population of 25,000 or more are included.]

State and city code[1]	City	Land area,[2] 1990 (Sq. mi.)	Population: 1992: Total persons	Population: 1992: Rank[3]	Population: 1992: Per square mile[4]	Population: 1990	Population: 1980	Net change, 1980–1992: Number	Net change, 1980–1992: Percent	Population characteristics, 1990: Race: White	Race: Black	Race: American Indian, Eskimo, or Aleut	Asian or Pacific Islander: Total[5]	Asian or Pacific Islander: Chinese	Asian or Pacific Islander: Filipino
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
	TEXAS—Con.														
48 31928	Haltom City city	12.3	34 822	791	2 831	32 856	29 014	5 808	20.0	29 514	418	242	1 590	28	22
48 32372	Harlingen city	26.9	51 982	500	1 932	48 735	43 543	8 419	19.3	39 015	371	104	207	54	61
48 35000	Houston city	539.9	1 690 180	4	3 131	1 630 553	1 595 138	95 042	6.0	859 069	457 990	4 126	67 113	17 317	5 566
48 35528	Huntsville city	21.0	28 523	978	1 358	27 925	23 936	4 587	19.2	18 071	7 481	113	260	63	33
48 35576	Hurst city	9.9	34 417	801	3 476	33 574	31 420	2 997	9.5	31 343	875	155	416	48	40
48 37000	Irving city	67.6	161 281	110	2 386	155 037	109 943	51 318	46.7	122 068	11 653	1 006	7 146	765	458
48 39148	Killeen city	27.7	66 574	360	2 403	63 535	46 296	20 278	43.8	38 908	19 109	340	3 654	91	527
48 39352	Kingsville city	12.7	25 432	1 060	2 003	25 276	28 808	-3 376	-11.7	16 886	951	64	395	55	125
48 41440	La Porte city	16.3	29 409	945	1 524	27 910	14 062	15 347	109.1	23 810	1 983	140	281	37	53
48 41464	Laredo city	32.9	136 508	138	4 149	122 899	91 449	45 059	49.3	67 046	144	195	473	85	30
48 41980	League City city	51.4	33 638	827	654	30 159	16 578	17 060	102.9	28 575	1 547	103	699	124	111
48 42508	Lewisville city	36.0	49 848	529	1 385	46 521	24 273	25 575	105.4	41 226	2 159	278	892	142	31
48 43888	Longview city	52.3	72 695	315	1 390	70 311	62 762	9 933	15.8	53 884	13 989	308	415	85	43
48 45000	Lubbock city	104.1	187 941	89	1 805	186 206	174 361	13 580	7.8	144 549	15 939	570	2 617	670	234
48 45072	Lufkin city	23.6	31 295	893	1 326	30 206	28 562	2 733	9.6	19 701	8 222	58	240	17	43
48 45384	McAllen city	32.4	90 252	233	2 786	84 021	66 281	23 971	36.2	59 603	288	185	576	144	67
48 47892	Mesquite city	42.8	108 324	177	2 531	101 484	67 053	41 271	61.5	88 501	5 912	557	2 666	140	671
48 48072	Midland city	65.8	95 167	217	1 446	89 443	70 525	24 642	34.9	71 382	8 179	332	858	197	76
48 48768	Mission city	13.9	32 750	849	2 356	28 653	22 653	10 097	44.6	21 595	47	51	42	6	4
48 48804	Missouri City city	23.2	41 582	649	1 792	36 176	24 423	17 159	70.3	21 922	10 653	102	2 261	391	486
48 50256	Nacogdoches city	24.9	30 678	915	1 232	30 872	27 149	3 529	13.0	22 701	6 938	64	268	38	61
48 50820	New Braunfels city	25.4	29 040	957	1 143	27 334	22 402	6 638	29.6	23 383	344	66	94	8	5
48 52356	North Richland Hills city	18.2	50 358	521	2 767	45 895	30 592	19 766	64.6	42 975	832	238	754	118	39
48 53388	Odessa city	35.4	93 760	222	2 649	89 699	90 027	3 733	4.1	67 624	5 355	447	614	82	127
48 56000	Pasadena city	43.8	125 418	148	2 863	119 363	112 560	12 858	11.4	99 943	1 162	579	1 873	159	150
48 57200	Pharr city	15.8	35 798	767	2 266	32 921	21 381	14 417	67.4	23 122	38	61	32	10	3
48 58016	Plano city	66.2	142 108	125	2 147	128 713	72 331	69 775	96.5	113 879	6 325	441	5 158	2 075	385
48 58820	Port Arthur city	77.2	59 677	404	773	58 724	61 251	-1 574	-2.6	28 955	24 778	147	2 825	31	56
48 61796	Richardson city	28.3	78 364	300	2 698	74 840	72 496	3 868	5.3	64 947	3 502	239	4 849	2 259	246
48 63500	Round Rock city	19.1	35 016	786	1 833	30 923	12 740	22 276	174.9	28 175	1 714	135	331	28	23
48 64472	San Angelo city	47.9	86 099	250	1 797	84 474	73 240	12 859	17.6	68 571	4 057	319	961	101	174
48 65000	San Antonio city	333.0	966 437	10	2 902	935 933	785 940	180 497	23.0	676 082	65 884	3 303	10 703	2 094	1 857
48 65600	San Marcos city	17.4	29 494	942	1 695	28 743	23 420	6 074	25.9	22 527	1 535	66	258	39	29
48 67496	Sherman city	37.4	31 153	898	833	31 601	30 413	740	2.4	26 298	3 990	298	242	50	25
48 72176	Temple city	43.0	45 103	588	1 049	46 109	42 354	2 749	6.5	33 571	7 898	164	423	104	42
48 72368	Texarkana city	21.1	32 122	876	1 522	31 656	31 271	851	2.7	19 934	11 382	115	144	24	11
48 72392	Texas City city	62.1	41 721	644	672	40 822	41 201	520	1.3	27 391	10 262	165	468	21	73
48 74144	Tyler city	39.7	76 872	298	1 936	75 450	70 508	6 364	9.0	48 891	21 252	214	388	92	61
48 75428	Victoria city	30.1	57 388	425	1 907	55 076	50 695	6 693	13.2	42 382	4 373	142	227	35	31
48 76000	Waco city	75.8	103 997	194	1 372	103 590	101 261	2 736	2.7	70 031	23 972	291	955	236	107
48 79000	Wichita Falls city	54.1	95 018	218	1 756	96 259	94 201	817	.9	77 415	10 788	693	1 762	164	251
49 00000	UTAH	82 168.1	1 811 215	X	22	1 722 850	1 461 037	350 178	24.0	1 615 845	11 576	24 283	33 371	5 322	1 905
49 07690	Bountiful city	10.7	37 801	725	3 533	36 659	32 877	4 924	15.0	36 012	35	100	347	76	14
49 43660	Layton city	18.3	45 622	580	2 493	41 784	22 862	22 760	99.6	38 727	864	278	965	70	195
49 45860	Logan city	14.1	33 874	819	2 402	32 762	26 844	7 030	26.2	29 933	193	412	1 673	493	38
49 53230	Murray city	9.5	32 441	862	3 415	31 282	25 750	6 691	26.0	29 968	205	170	463	75	13
49 55980	Ogden city	26.1	66 236	383	2 538	63 909	64 407	1 829	2.8	55 885	1 741	687	1 123	103	80
49 57300	Orem city	17.9	69 437	341	3 879	67 561	52 399	17 038	32.5	55 121	88	534	1 041	148	45
49 62470	Provo city	38.6	91 194	230	2 363	86 835	74 111	17 083	23.1	81 683	229	929	2 374	628	109
49 65330	St. George city	57.5	32 725	850	569	28 502	11 350	21 375	188.3	27 586	52	464	200	13	27
49 67000	Salt Lake City city	109.0	165 835	106	1 521	159 936	163 034	2 801	1.7	139 177	2 752	2 541	7 568	1 641	198
49 67550	Sandy city	20.0	81 003	278	4 050	75 058	52 210	28 793	55.1	72 846	140	232	1 271	243	39
49 82950	West Jordan city	26.8	46 650	567	1 741	42 892	27 325	19 325	70.7	40 324	121	272	825	75	51
49 83445	West Valley City city	34.0	91 733	229	2 698	86 976	(6)	(6)	(6)	79 018	737	957	3 446	245	132
50 00000	VERMONT	9 249.3	571 334	X	62	562 758	511 456	59 878	11.7	555 088	1 951	1 696	3 215	679	253
50 10675	Burlington city	10.5	38 569	706	3 673	39 127	37 712	857	2.3	37 676	390	123	583	140	38
51 00000	VIRGINIA	39 597.8	6 394 481	X	161	6 187 358	5 346 797	1 047 684	19.6	4 791 739	1 162 994	15 282	159 053	21 238	35 067
51 01000	Alexandria city	15.3	113 134	168	7 394	111 183	103 217	9 917	9.6	78 789	24 339	333	4 632	629	740
51 07784	Blacksburg town	18.8	34 939	787	1 858	34 590	30 638	4 301	14.0	30 243	1 477	37	2 663	819	217
51 14968	Charlottesville city	10.3	40 558	672	3 938	40 341	39 916	642	1.6	30 684	8 561	39	935	262	95
51 16000	Chesapeake city	340.7	166 005	105	487	151 976	114 486	51 519	45.0	107 399	41 662	444	1 899	168	989
51 21344	Danville city	43.1	53 571	480	1 243	53 056	45 642	7 929	17.4	33 247	19 431	72	262	41	63
51 35000	Hampton city	51.8	137 048	135	2 646	133 793	122 617	14 431	11.8	78 149	51 881	392	2 339	217	419
51 35624	Harrisonburg city	17.6	32 156	874	1 827	30 707	19 671	12 485	63.5	27 968	2 018	37	469	83	63
51 47672	Lynchburg city	49.4	66 097	364	1 338	66 049	66 743	-646	-1.0	47 853	17 445	105	501	100	69

[1]Federal Information Processing Standards (FIPS) State and place codes. [2]Dry land and land temporarily or partially covered by water. [3]Based on 1,078 cities with 1990 population of 25,000 or more; this figure includes 8 census designated places in Hawaii which has no incorporated cities. When cities share the same rank, the next lower rank is omitted. [4]Based on 1990 land area. [5]Includes other race groups, not shown separately. [6]Not an incorporated place on January 1, 1980.

C-01-003

REFERENCE 10

U.S. Environmental Protection Agency, Geographical Exposure Modeling System (GEMS) database, compiled from U.S. Census Bureau 1990 data, accessed 21 June 1994.

NIPCO INC
GEMS SEARCH
JUNE 21, 1994

COVERAGE

========

STATE	COUNTY	STATE NAME	COUNTY NAME
48	135	Texas	Ector Co

CENTER POINT AT STATE : 48 Texas

COUNTY : 135 Ector Co

REGION OF THE COUNTRY

======================

Zipcode found: 79762 at a distance of 2.8 Km

STATE	CITY NAME	COMMUNITY	FIPSCODE	LATITUDE	LONGITUDE
TX	ODESSA	CRESTWOOD	48135	31.8833	102.3750

CENSUS DATA

============

ID - 001

NIPCO INC

LATITUDE 31:52:41 LONGITUDE 102:24:13 1990 POPULATION

	1/4	1/2	1	2	3	4 MILES	
KM	0.00-.400	.400-.800	.800-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	1724	0	1817	7519	233	11293
S 2	0	0	2227	9688	23685	12148	47748
S 3	0	0	1268	7311	9474	8598	26651
S 4	0	0	0	0	756	0	756
RING TOTALS	0	1724	3495	18816	41434	20979	86448

STAR STATION

WBAN NUMBER	STATION NAME	LATITUDE	LONGITUDE	PERIOD OF RECORD	DISTANCE (km)
23023	MIDLAND/SLOAN TX	31.9333	102.200	1960-1964	20.2
93034	HOBBS/LEA CO NM	32.6833	103.200	1949-1954	116.6
23034	SAN ANGELO/MATHIS TX	31.3667	100.500	1960-1964	188.8
23042	LUBBOCK/WEST AIR TERM TX	33.6500	101.817	1969-1973	204.3
23009	ROSWELL/WALKER/IND NM	33.3000	104.533	1949-1954	254.3
23043	ROSWELL NM	33.4000	104.533	1949-1954	261.3
13962	ABILENE TX	32.4333	99.6833	1967-1971	263.2

U.S. SOIL DATA

STATE : TEXAS

LATITUDE : 31:52:41 LONGITUDE : 102:24:13

THE STATION IS INSIDE H.U. 12080005

GROUND WATER ZONE	:	7		
RUNOFF SOIL TYPE	:	2		
EROSION	:	1.1210E-03		CM/MONTH
DEPTH TO GROUND WATER BETWEEN	:	1.0000E+03	AND 3.0000E+03	
FIELD CAPACITY FOR TOP SOIL	:	7.2000E-02		
EFFECTIVE POROSITY BETWEEN	:	1.0000E-02	AND 1.0000E-01	
SEEPAGE TO GROUNDWATER BETWEEN	:	2.7800E+02	AND 2.7800E+03	CM/MONTH
DISTANCE TO DRINKING WELL	:	2.8000E+04		CM

U.S. CITY

STATE	PLACE NAME	FIPSCODE	LATITUDE	LONGITUDE
TX	GARDENDALE	48135	31.9033	102.3817
TX	ODESSA	48135	31.8583	102.3746

10-003

REFERENCE 11

U.S. Environmental Protection Agency, Potential Hazardous Waste Site, Site Name: Nipco Inc., from: Dave Peters, Chief - Hazardous Waste Section, to: Sam Nott, Chief - Enforcement Section, 20 January 1984.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

DATE: 1-20-84

SUBJECT: Potential Hazardous Waste Site

FROM: for Dave Peters, Chief
Hazardous Waste Section (6ES-SH)
Philip A. Crocker

TO: Sam Nott, Chief
Enforcement Section (6AW-SE)

Site Name: Nipco Inc
Location: Odessa, TX
Hazsit No.: TX 9920 TXD 062286729
TDD No.: R6-8309-13

A. Field Report:

T2070-2 attached ( )
T2070-3 attached (✓)
Letter report attached ( )

B. Were drinking water wells sampled? yes ( ) no (✓)

C. Analytical Data: N/A

1. FIT data review attached ( )
2. Contract lab results: attached ( )
3. Houston Lab results attached ( )

D. Comments: Although there have been prior problems with waste handling at this site, there do not appear to be any problems at present. Since TDWR maintains a yearly inspection schedule here, no further FIT/EPA action is recommended

SUPERFUND
FILE
DEC 28 1992
REORGANIZED

RECEIVED
EPA REGION VI
1984 JAN 23 AM 8:02
SUPERFUND BRANCH

EPA Form 1320-6 (Rev. 3-76)

11-001

R-6-8309-13

EPA

POTENTIAL HAZARDOUS WASTE SITE
SITE INSPECTION REPORT

REGION: 6
SITE NUMBER (to be assigned by Hq): TX 9920

GENERAL INSTRUCTIONS: Complete Sections I and III through XV of this form as completely as possible. Then use the information on this form to develop a Tentative Disposition (Section II). File this form in its entirety in the regional Hazardous Waste Log File. Be sure to include all appropriate Supplemental Reports in the file. Submit a copy of the forms to: U.S. Environmental Protection Agency; Site Tracking System; Hazardous Waste Enforcement Task Force (EN-335); 401 M St., SW; Washington, DC 20460.

I. SITE IDENTIFICATION

TXD 062 286729

A. SITE NAME: Nipco, Inc.
B. STREET (or other identifier): 2104 W. 42nd St. P.O. Box 1785
C. CITY: Odessa
D. STATE: TX
E. ZIP CODE: 79760
F. COUNTY NAME: Ector

G. SITE OPERATOR INFORMATION
1. NAME: W.A. Fields, President
2. TELEPHONE NUMBER: 915-362-7211
3. STREET: 2104 W. 42nd St. P.O. Box 1785
4. CITY: Odessa
5. STATE: TX
6. ZIP CODE: 79760

H. REALTY OWNER INFORMATION (if different from operator of site)
1. NAME: Nipco, Inc.
2. TELEPHONE NUMBER: 915-362-1936
3. CITY: Odessa
4. STATE: TX
5. ZIP CODE: 79760

I. SITE DESCRIPTION
Plating and coating operation (Nickel, Tin, Zinc)

J. TYPE OF OWNERSHIP
☐ 1. FEDERAL ☐ 2. STATE ☐ 3. COUNTY ☐ 4. MUNICIPAL ☒ 5. PRIVATE

II. TENTATIVE DISPOSITION (complete this section last)

A. ESTIMATE DATE OF TENTATIVE DISPOSITION (mo., day, & yr.):

B. APPARENT SERIOUSNESS OF PROBLEM
☐ 1. HIGH ☐ 2. MEDIUM ☐ 3. LOW ☒ 4. NONE

C. PREPARER INFORMATION
1. NAME: Thomas A. Walzer (signature)
Thomas A. Walzer - FIT
2. TELEPHONE NUMBER: 214-742-6601
3. DATE (mo., day, & yr.): 1-5-84

III. INSPECTION INFORMATION

A. PRINCIPAL INSPECTOR INFORMATION
1. NAME: Imre Sekelyhidi
2. TITLE: FIT - Environmental Engineer
3. ORGANIZATION: Ecology And Environment, Inc. 1509 Main St. #814 Dallas, TX 75201
4. TELEPHONE NO. (area code & no.): 214-742-6601

B. INSPECTION PARTICIPANTS

1. NAME	2. ORGANIZATION	3. TELEPHONE NO.
Thomas A. Walzer	Ecology And Environment, Inc.	214-742-6601

C. SITE REPRESENTATIVES INTERVIEWED (corporate officials, workers, residents)

1. NAME	2. TITLE & TELEPHONE NO.	3. ADDRESS
W.A. (Pete) Fields	President 915-362-1936	2104 W. 42nd St. P.O. Box 1785 Odessa, TX 79760

SUPERFUND FILE
DEC 28 1992
REORGANIZED

REVIEWED BY REGN
DATE 1-24-84

EPA Form T2070-3 (10-79)

11-002

Continue On Reverse

Continued From Front

III. INSPECTION INFORMATION (continued)

D. GENERATOR INFORMATION (sources of waste)

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE GENERATED
Nipco	915-362-1936	P.O. Box 1785 Odessa TX 79760 2104 W. 42nd St. Odessa, TX	Wash water from plating solutions.

E. TRANSPORTER/HAULER INFORMATION

1. NAME	2. TELEPHONE NO.	3. ADDRESS	4. WASTE TYPE TRANSPORTED
BFI	915-333-2826	P.O. Box 6509 Odessa, TX 79762	Wash water from plating solution
Nipco, Inc.	915-362-1936	P.O. Box 1785 Odessa, TX 79760	spent Nickle plating solution

F. IF WASTE IS PROCESSED ON SITE AND ALSO SHIPPED TO OTHER SITES, IDENTIFY OFF-SITE FACILITIES USED FOR DISPOSAL.

1. NAME	2. TELEPHONE NO.	3. ADDRESS
BFI	915-333-2826	P.O. Box 6509 Odessa, TX 79762

G. DATE OF INSPECTION (mo., day, & yr.)	H. TIME OF INSPECTION	I. ACCESS GAINED BY: (credentials must be shown in all cases)
11-16-83	1300 hrs.	[X] 1. PERMISSION [ ] 2. WARRANT

J. WEATHER (describe)

Clear and warm (about $70^{0}F$)

IV. SAMPLING INFORMATION

A. Mark 'X' for the types of samples taken and indicate where they have been sent e.g., regional lab, other EPA lab, contractor, etc. and estimate when the results will be available.

1. SAMPLE TYPE	2. SAMPLE TAKEN (mark 'X')	3. SAMPLE SENT TO:	4. DATE RESULTS AVAILABLE
a. GROUNDWATER			
b. SURFACE WATER			
c. WASTE			
d. AIR			
e. RUNOFF			
f. SPILL			
g. SOIL			
h. VEGETATION			
i. OTHER (specify)	X	No samples were taken during inspection	

B. FIELD MEASUREMENTS TAKEN (e.g., radioactivity, explosivity, PH, etc.)

1. TYPE	2. LOCATION OF MEASUREMENTS	3. RESULTS
None		

11-003

Continued From Page 2

IV. SAMPLING INFORMATION (continued)

C. PHOTOS

1. TYPE OF PHOTOS: [X] a. GROUND [ ] b. AERIAL
2. PHOTOS IN CUSTODY OF: EPA Region 06 (attached)

D. SITE MAPPED?

[X] YES. SPECIFY LOCATION OF MAPS: EPA Region 06 (attached)

E. COORDINATES

1. LATITUDE (deg.-min.-sec.): 31°52'41" N
2. LONGITUDE (deg.-min.-sec.): 102°24'13" W

V. SITE INFORMATION

A. SITE STATUS

[X] 1. ACTIVE (Those industrial or municipal sites which are being used for waste treatment, storage, or disposal on a continuing basis, even if infrequently.)

[ ] 2. INACTIVE (Those sites which no longer receive wastes.)

[ ] 3. OTHER (specify): (Those sites that include such incidents like "midnight dumping" where no regular or continuing use of the site for waste disposal has occurred.)

B. IS GENERATOR ON SITE?

[ ] 1. NO [X] 2. YES (specify generator's four-digit SIC Code): 3471

C. AREA OF SITE (in acres): 2

D. ARE THERE BUILDINGS ON THE SITE? [ ] 1. NO [X] 2. YES (specify): Plating and coating plant.

VI. CHARACTERIZATION OF SITE ACTIVITY

Indicate the major site activity(ies) and details relating to each activity by marking 'X' in the appropriate boxes.

X	A. TRANSPORTER	X	B. STORER	X	C. TREATER	X	D. DISPOSER
		X					
	1. RAIL		1. PILE		1. FILTRATION		1. LANDFILL
	2. SHIP		2. SURFACE IMPOUNDMENT		2. INCINERATION		2. LANDFARM
	3. BARGE	X	3. DRUMS		3. VOLUME REDUCTION		3. OPEN DUMP
X	4. TRUCK		4. TANK, ABOVE GROUND		4. RECYCLING/RECOVERY		4. SURFACE IMPOUNDMENT
	5. PIPELINE		5. TANK, BELOW GROUND		5. CHEM./PHYS./TREATMENT		5. MIDNIGHT DUMPING
X	6. OTHER (specify): Periodically when nickel solution is changed-will transport to BFI facility for disposal	X	6. OTHER (specify): Fiberglass lined pit, periodically drained by BFI for disposal in injection well.		6. BIOLOGICAL TREATMENT		6. INCINERATION
					7. WASTE OIL REPROCESSING		7. UNDERGROUND INJECTION
					8. SOLVENT RECOVERY		8. OTHER (specify): N/A
					9. OTHER (specify): N/A		

E. SUPPLEMENTAL REPORTS: If the site falls within any of the categories listed below, Supplemental Reports must be completed. Indicate which Supplemental Reports you have filled out and attached to this form.

[ ] 1. STORAGE [ ] 2. INCINERATION [ ] 3. LANDFILL [X] 4. SURFACE IMPOUNDMENT [ ] 5. DEEP WELL
[ ] 6. CHEM/BIO/PHYS TREATMENT [ ] 7. LANDFARM [ ] 8. OPEN DUMP [ ] 9. TRANSPORTER [ ] 10. RECYCLOR/RECLAIMER

VII. WASTE RELATED INFORMATION

A. WASTE TYPE

[X] 1. LIQUID [ ] 2. SOLID [ ] 3. SLUDGE [ ] 4. GAS

B. WASTE CHARACTERISTICS

[ ] 1. CORROSIVE [ ] 2. IGNITABLE [ ] 3. RADIOACTIVE [ ] 4. HIGHLY VOLATILE
[X] 5. TOXIC [ ] 6. REACTIVE [ ] 7. INERT [ ] 8. FLAMMABLE
[ ] 9. OTHER (specify):

C. WASTE CATEGORIES

1. Are records of wastes available? Specify items such as manifests, inventories, etc. below.

Records available at Nipco, Inc.

11-004

Continued From Front

VII. WASTE RELATED INFORMATION (continued)

2. Estimate the amount (specify unit of measure) of waste by category; mark 'X' to indicate which wastes are present.

a. SLUDGE	b. OIL	c. SOLVENTS	d. CHEMICALS	e. SOLIDS	f. OTHER
AMOUNT 1	AMOUNT None	AMOUNT None	AMOUNT 2-3000	AMOUNT 1 or 2	AMOUNT None
UNIT OF MEASURE barrel/month	UNIT OF MEASURE	UNIT OF MEASURE	UNIT OF MEASURE gallon/month	UNIT OF MEASURE barrel/month	UNIT OF MEASURE
(1) PAINT, PIGMENTS	(1) OILY WASTES	(1) HALOGENATED SOLVENTS	(1) ACIDS	(1) FLYASH	(1) LABORATORY, PHARMACEUT.
X (2) METALS SLUDGES	(2) OTHER (specify):	(2) NON-HALOGNTD. SOLVENTS	(2) PICKLING LIQUORS	(2) ASBESTOS	(2) HOSPITAL
(3) POTW		(3) OTHER (specify):	(3) CAUSTICS	(3) MILLING/MINE TAILINGS	(3) RADIOACTIVE
(4) ALUMINUM SLUDGE			(4) PESTICIDES	(4) FERROUS SMELTING WASTES	(4) MUNICIPAL
X (5) OTHER (specify): Nickel sludge in plastic barrel from metal plating			(5) DYES/INKS	(5) NON-FERROUS SMLTG. WASTES	(5) OTHER (specify):
			(6) CYANIDE	X (6) OTHER (specify): Filters contaminated with nickel zinc, tin and copper.	
			(7) PHENOLS		
			(8) HALOGENS		
			(9) PCB		
			X (10) METALS		
			(11) OTHER (specify):		

3. LIST SUBSTANCES OF GREATEST CONCERN WHICH ARE ON THE SITE (place in descending order of hazard)

1. SUBSTANCE	2. FORM (mark 'X') a. SOLID	b. LIQ.	c. VAPOR	3. TOXICITY (mark 'X') a. HIGH	b. MED.	c. LOW	d. NONE	4. CAS NUMBER	5. AMOUNT	6. UNIT
Nickel		X						7440-02-0	Unknown	
Zinc		X						7440-66-6	Unknown	
Tin		X						7440-31-5	Unknown	
Cadimum		X						7440-43-9	Unknown	

VIII. HAZARD DESCRIPTION

FIELD EVALUATION HAZARD DESCRIPTION: Place an 'X' in the box to indicate that the listed hazard exists. Describe the hazard in the space provided.

A. HUMAN HEALTH HAZARDS

Continued From Page 4

VIII. HAZARD DESCRIPTION (continued)

☐ B. NON-WORKER INJURY/EXPOSURE

☐ C. WORKER INJURY/EXPOSURE

☐ D. CONTAMINATION OF WATER SUPPLY

☐ E. CONTAMINATION OF FOOD CHAIN

☐ F. CONTAMINATION OF GROUND WATER

☐ G. CONTAMINATION OF SURFACE WATER

11 – DDb

Continued From Front

VIII. HAZARD DESCRIPTION *(continued)*

☐ H. DAMAGE TO FLORA/FAUNA

☐ I. FISH KILL

☐ J. CONTAMINATION OF AIR

☐ K. NOTICEABLE ODORS

☐ L. CONTAMINATION OF SOIL

☐ M. PROPERTY DAMAGE

 Continue On Page 7

11 - 007

Continued From Page 5

VIII. HAZARD DESCRIPTION (continued)

☐ N. FIRE OR EXPLOSION

☐ O. SPILLS/LEAKING CONTAINERS/RUNOFF/STANDING LIQUID

☐ P. SEWER, STORM DRAIN PROBLEMS

☐ Q. EROSION PROBLEMS

☐ R. INADEQUATE SECURITY

☐ S. INCOMPATIBLE WASTES

 Continue On Reverse

VIII. HAZARD DESCRIPTION (continued)

[ ] T. MIDNIGHT DUMPING

[X] U. OTHER (specify): Operations were started at present site in Dec, 1978. Factory was set up so that wash and rinse water ran into an unlined sump at the north end of the building. The sump was originally 4 to 6 feet deep. In 1979 TDWR inspectors found this set up unsatisfactory. In August of 1979, the swamp was dug out and a fiberglass tank placed in the hole as a liner. This was to hold the water so that it could be recycled for usage in rinse water and cleaning of materials for plating (see attachment A). The nickel solution must be changed periodically. the two vats (one 400 gallons, the other 132 gallons) are emptied into barrels and hauled by the generator (NIPCO) to a BFI injection well. Since TDWR has been maintaining a yearly inspection schedule at this site, no further FIT/EPA action is recommended.

IX. POPULATION DIRECTLY AFFECTED BY SITE

A. LOCATION OF POPULATION	B. APPROX. NO. OF PEOPLE AFFECTED	C. APPROX. NO. OF PEOPLE AFFECTED WITHIN UNIT AREA	D. APPROX. NO. OF BUILDINGS AFFECTED	E. DISTANCE TO SITE (specify units)
1. IN RESIDENTIAL AREAS	1000	1000	20	¼ mile
2. IN COMMERCIAL OR INDUSTRIAL AREAS	1000	1000	20	½ mile
3. IN PUBLICLY TRAVELLED AREAS	1000	1000	-	¼ mile
4. PUBLIC USE AREAS (parks, schools, etc.)	-	-	-	¼ mile

X. WATER AND HYDROLOGICAL DATA

A. DEPTH TO GROUNDWATER (specify unit)	B. DIRECTION OF FLOW	C. GROUNDWATER USE IN VICINITY
Static water 75 to 80 ft.	South	Drinking
D. POTENTIAL YIELD OF AQUIFER	**E. DISTANCE TO DRINKING WATER SUPPLY (specify unit of measure)**	**F. DIRECTION TO DRINKING WATER SUPPLY**
20-40 gpm	100 feet	north

G. TYPE OF DRINKING WATER SUPPLY

[X] 1. NON-COMMUNITY < 15 CONNECTIONS [ ] 2. COMMUNITY (specify town): > 15 CONNECTIONS

[ ] 3. SURFACE WATER [X] 4. WELL

 Continue On Page 9

11-009

Continued From Page 3

X. WATER AND HYDROLOGICAL DATA (continued)

F. LIST ALL DRINKING WATER WELLS WITHIN A 1/4 MILE RADIUS OF SITE

1. WELL	2. DEPTH (specify unit)	3. LOCATION (proximity to population/ buildings)	4. NON-COMMUNITY (mark 'X')	5. COMMUNITY (mark 'X')
	120 ft. static 78'	Slough Equip. Co., Inc. 2501 W. 42nd Street	X	
		Odessa TX		
	1351 ft. static 80'	Nickerson Drilling and Supply Ector 4 mi. NW Downtown	X	
	132 ft. static 81'	BOW Company P.O. Box 1162, 2412 W. 42nd St. Odessa, TX E 4 mile NWO	X	
	120 ft. static 75'	Hydro-tech Oil Tools 2723 W. 42nd St. Odessa, TX 79762 4 mi. NWO	X	

G. RECEIVING WATER

1. NAME: Monahans Draw, Beale Creek Colorado River

☐ 2. SEWERS ☐ 3. STREAMS/RIVERS X 4. LAKES/RESERVOIRS ☐ 5. OTHER(specify):

6. SPECIFY USE AND CLASSIFICATION OF RECEIVING WATERS

Contact recreation, noncontact recreation, propagation of fish and wildlife.

XI. SOIL AND VEGITATION DATA

LOCATION OF SITE IS IN: None

☐ A. KNOWN FAULT ZONE ☐ B. KARST ZONE ☐ C. 100 YEAR FLOOD PLAIN ☐ D. WETLAND

☐ E. A REGULATED FLOODWAY ☐ F. CRITICAL HABITAT ☐ G. RECHARGE ZONE OR SOLE SOURCE AQUIFER

XII. TYPE OF GEOLOGICAL MATERIAL OBSERVED

Mark 'X' to indicate the type(s) of geological material observed and specify where necessary, the component parts.

"X"	A. OVERBURDEN	"X"	B. BEDROCK (specify below)	"X"	C. OTHER (specify below)
X		X		X	
X	1. SAND	X	Windblown cover sand		Loess loam
	2. CLAY				
	3. GRAVEL				

XIII. SOIL PERMEABILITY

☐ A. UNKNOWN ☐ B. VERY HIGH (100,000 to 1000 cm/sec.) ☐ C. HIGH (1000 to 10 cm/sec.)

X D. MODERATE (10 to .1 cm/sec.) ☐ E. LOW (.1 to .001 cm/sec.) ☐ F. VERY LOW (.001 to .00001 cm/sec.)

G. RECHARGE AREA

☐ 1. YES X 2. NO 3. COMMENTS:

H. DISCHARGE AREA

☐ 1. YES X 2. NO 3. COMMENTS:

I. SLOPE

1. ESTIMATE % OF SLOPE: 1 to 2%

2. SPECIFY DIRECTION OF SLOPE, CONDITION OF SLOPE, ETC.: South

J. OTHER GEOLOGICAL DATA

Fine to medium-grained quartz, silty, calcareous caliche modules massive, grayish red; thickness 20 feet, further out locally (mostly Illinoian, may include younger deposits.

Continued From Front

XIV. PERMIT INFORMATION

List all applicable permits held by the site and provide the related information.

A. PERMIT TYPE (e.g., RCRA, State, NPDES, etc.)	B. ISSUING AGENCY	C. PERMIT NUMBER	D. DATE ISSUED (mo., day, & yr.)	E. EXPIRATION DATE (mo., day, & yr.)	F. IN COMPLIANCE (mark 'X') 1. YES	2. NO	3. UNKNOWN
Solid Waste	Registration Number #31769						

XV. PAST REGULATORY OR ENFORCEMENT ACTIONS

☐ NONE ☒ YES *(summarize in this space)*

On 9-22-83 a TDWR inspector noted several points of non-compliance (see attachment B).

NOTE: Based on the information in Sections III through XV, fill out the Tentative Disposition *(Section II)* information on the first page of this form.

11 — 011

SURFACE IMPOUNDMENTS SITE INSPECTION REPORT
(Supplemental Report)

INSTRUCTION
Answer and Explain as Necessary.

1. TYPE OF IMPOUNDMENT

Pit

2. STABILITY/CONDITION OF EMBANKMENTS

1 ft. high concrete wall

3. EVIDENCE OF SITE INSTABILITY *(Erosion, Settling, Sink Holes, etc.)*

☐ YES ☒ NO

4. EVIDENCE OF DISPOSAL OF IGNITABLE OR REACTIVE WASTE

☐ YES ☒ NO

5. ONLY COMPATIBLE WASTES ARE STORED OR DISPOSED OF IN THE IMPOUNDMENT

☒ YES ☐ NO

6. RECORDS CHECKED FOR CONTENTS AND LOCATION OF EACH SURFACE IMPOUNDMENT

☒ YES ☐ NO

7. IMPOUNDMENT HAS LINER SYSTEM

☒ YES ☐ NO Fiberglass tank

7a. INTEGRITY OF LINER SYSTEM CHECKED

☐ YES ☒ NO

7b. FINDINGS

N/A

8. SOIL STRUCTURE AND SUBSTRUCTURE

Sandy Clay

9. MONITORING WELLS

☐ YES ☒ NO

10. LENGTH, WIDTH, AND DEPTH

LENGTH 6 ft diameter WIDTH DEPTH 6 ft.

11. CALCULATED VOLUMETRIC CAPACITY

1000 gallons

12. PERCENT OF CAPACITY REMAINING

20%

13. ESTIMATE FREEBOARD

3 ft.

14. SOLIDS DEPOSITION

☐ YES ☒ NO

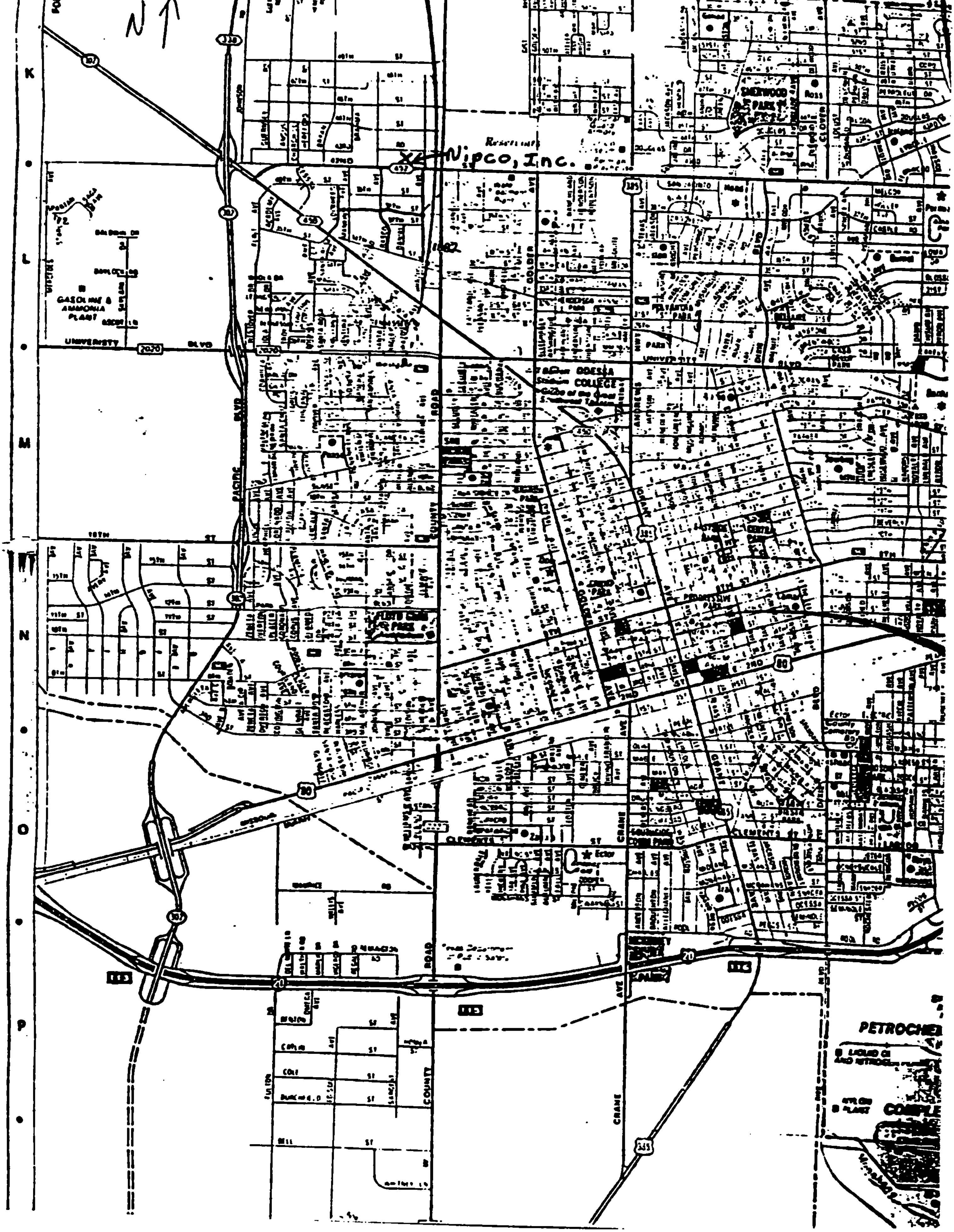
15. DREDGING DISPOSAL METHOD

None, Not needed

16. OTHER EQUIPMENT

Evaporator

11-012


N
X ← Nipco, Inc.
K
L
M
N
O
P
GASOLINE & AMMONIA PLANT
UNIVERSITY BLVD
PACIFIC BLVD
COUNTY ROAD
ODESSA COLLEGE
SHERWOOD PARK
CLEMENTS ST
CRANE
AVE
PETROCHEM
COMPLE

11-013

ODESSA NW QUADRANGLE
7.5 Minute Series(Topographic)
1964(Photorevised 1974)

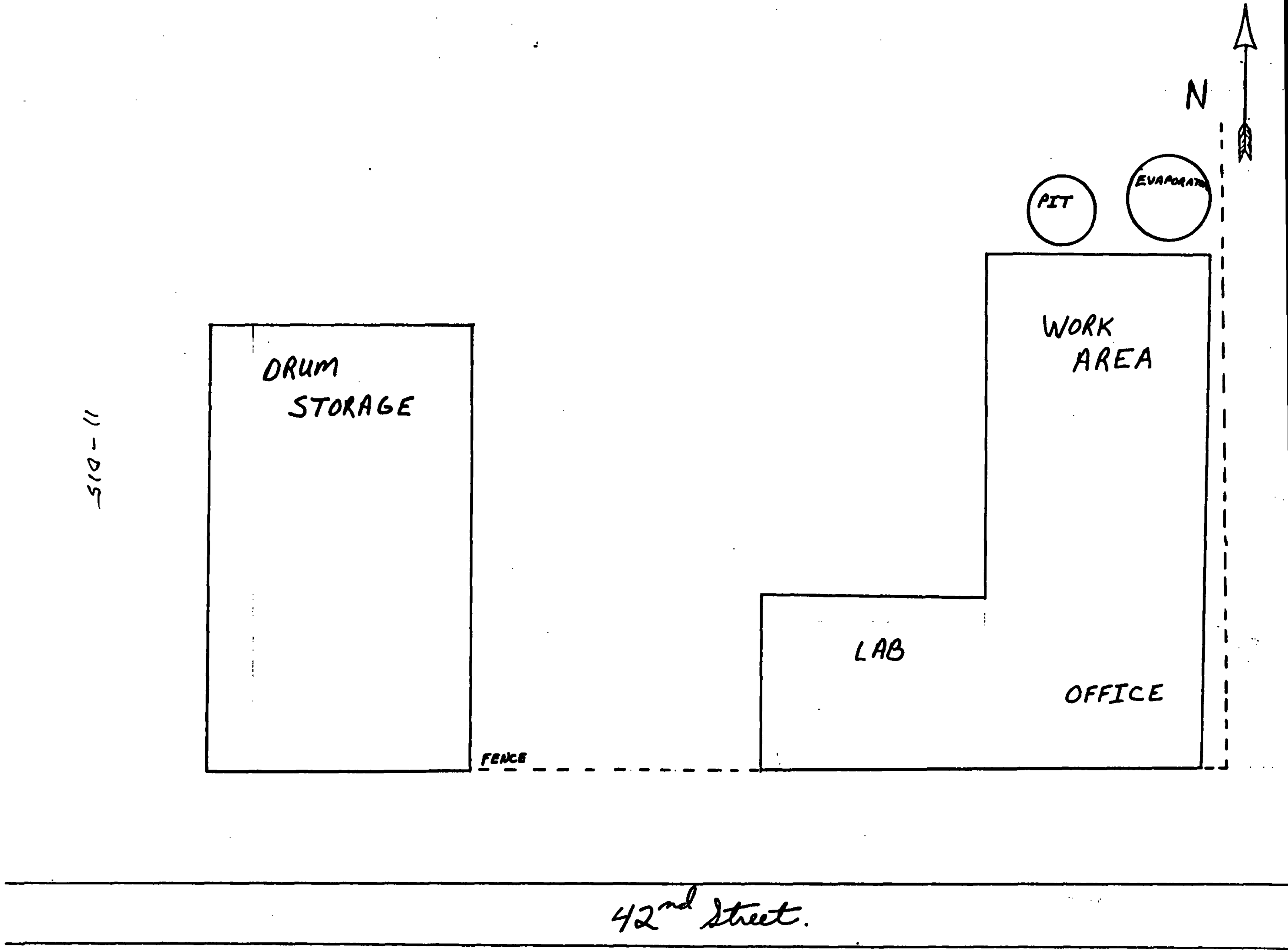
11-014

SCALE 1:24000

1 ½ 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER


N
PIT
EVAPORATO
WORK AREA
DRUM STORAGE
LAB
OFFICE
FENCE
42nd Street.

No. HM 0361

District 10 County Ector Basin Colorado

Discharger Name NEPCO wash sump Time Collected 11/15/78

Plant Name Point of Collection dirt sump behind

Method of Flow Measurement sump -

Chlorine Contact Time N/A

Date Shipped 11/16/78

Collector's Signature Jack Ray Davis

PERMIT NUMBER	PAGE NO.	CARD TYPE	DATE Mo.	Day	Yr.	MAT. SAMP.
1 - 9	10 – 12	13	14 15	16 17	18 19	20
			1 1	1 5	7 8	

21 CODE	26 PARAMETER VALUE	35 CODE	40 PARAMETER VALUE	49 CODE	54 PARAMETER VALUE 62
Flow (gpd)		Water Temperature (°F)		pH	
0 0 0 5 6		0 0 0 1 1		0 0 4 0 0	
D.O. (mg/l)		Turbidity (JTU)			
0 0 3 0 0		0 0 0 7 0			

TEXAS WATER QUALITY BOARD 540 cwac 9105

Lab. Used SHD Lab. No. C9 1746 -

No. HM0361 District 10 Material Sampled: Raw, Partially Treated, Final, Stream

Type Sample: Heavy Metals Method of Preservation HNO3 to pH 2

Grab ✓ Composite Hr. Type Facility waste sump - nickel zinc plating shop -

Observations Auxiliary Tags N/A

Date Completed

Analyst's Signature

21 CODE	26 PARAMETER VALUE	35 CODE	40 PARAMETER VALUE	49 CODE	54 PARAMETER VALUE 62
Arsenic (ug/l)		Barium (ug/l)		Boron (ug/l)	
0 1 0 0 2		0 1 0 0 7		0 1 0 2 2	
Cadmium (ug/l)		Chromium (ug/l)		Copper (ug/l)	
0 1 0 2 7		0 1 0 3 4	2400	0 1 0 4 2	
Lead (ug/l)		Manganese (ug/l)		Mercury (ug/l)	
0 1 0 5 1		0 1 0 5 5		7 1 9 0 0	
Nickel (ug/l)		Selenium (ug/l)		Silver (ug/l)	
0 1 0 6 7	820	0 1 1 4 7		0 1 0 7 7	
Zinc (ug/l)					
0 1 0 9 2	22000				

11-016

WOLF PETRO LAB, INC.

DIAL EMERSON 6-9701
DIAL EMERSON 6-7171
2411 WEST 42ND STREET
P. O. BOX 643
ODESSA, TEXAS
79760

WATER ANALYSIS

Charge Nipco, Inc.
Test No. WT-79-24
Date of Run 2-15-79
Date Received 2-01-79

A Sample of Water from Water Well

Secured from 2104 West 42nd Street

At Ector County Texas Secured by W.A. Field

Purpose ______ Time ______ Date ______

Sampling Conditions: ______

CONSTITUENTS REPORTED AS PARTS PER MILLION UNLESS OTHERWISE SPECIFIED

P Alkalinity - - $CaCO_3$	0	Nickel	0
Total Alkalinity - - $CaCO_3$	330	Free Carbon Dioxide - - CO_2	14
Chloride - - Cl	1030	Zinc	0
Calcium - - Ca CO_3	795	Chromate - - CrO_4	0
Magnesium - - Mg CO_3	355	Copper	0
Sulfate - - SO_4	1500	Sodium - - Na	981
Total Hardness - - $CaCO_3$	1150	Carbonate - - CO_3	0
Tin	0	Bicarbonate - - HCO_3	109
Alumina - - Al_2O_3	0	Total Dissolved Solids	4991
Phosphate - - PO_4	0	pH @ 70 °F	7.75
Total Iron (Water)	0	Specific Conductance - - Micromhos	5546
Oil and Grease	0	Specific Gravity @ 60 °F	1.0035

COUPON DATA

Coupon No.	Initial Wt. Grams	Test Period	Terminal Wt. Grams	Wt. Loss Grams

Average Corrosion Rate MPY: Coupon No. ______

Average Corrosion Rate MPY: Coupon No. ______

Description of Corrosion ______

Copies To: 4-Mr. W. A. Field
P.O. Box 1785
Odessa, Texas 79762
1-File

11-017

Analyzed By: J. Wolf

RLB ~~AP~~ ZWP

Attachment A

P. O. BOX 1785 - 2104 W. 42ND.
915 - 382-1936 / 382-7211
ODESSA, TEXAS 79760

NIPCO INC.

816 S. LEECH ST.
505 - 393-1878
HOBBS, NEW MEXICO 88240

ELECTROLESS NICKEL PLATING
TIN & ZINC PLATING

RECEIVED
AUG 24 1979
D... ...
WATER RESOURCES
DISTRICT 10

August 23, 1979

Mr. Steve Jones

Registration 31469

Proposal for disposing of waste water generated at Nipco, Inc. 2104 W. 42ND. st. Odessa, Texas.

Waste water is retained in chemical resistant fiberglass tank. It will be picked up from tank, pumped through filters into a 4000 gal. fiberglass holding tank where it will be pumped back into the plant where it will be recycled for usage in rinse vats and cleaning of materials to be plated. All excess waste water will be transferred to an offsite disposal well located in Odessa operated by SFI.

Sincerely yours,

W.A. Fields

W.A. FIELDS, President
NIPCO, INC.
P.O. BOX 1785
2104 W. 42ND. ST.
ODESSA, TEXAS 79760

11-018

Attachment B

October 5, 1983

Mr. W.A. Fields
President
Nipco, Inc.
P.O. Box 1785
Odessa, TX 79760

Dear Mr. Fields:

Re: Solid Waste Registration Number 31769; Annual Solid Waste Compliance Inspection

On September 22, 1983, District 10 Field Representative, Joan Middleton, conducted an annual compliance inspection of the Nipco, Inc. facility.

The waste generated (wastewater from plating baths and rinse vats containing nickel, zinc, tin, and copper) is currently exempt from the requirements outlined in the Texas Department of Water Resources Industrial Solid Waste Rules, Texas Administrative Code (TAC) Sections 335.41(g) and 335.452 due to the beneficial recycling of the wastes.

There were several areas of non-compliance noted during the inspection:

1) Failure to provide written notice to the Executive Director concerning:

   a) the sludge accumulation from the plating baths, rinse vats and cleaning of vats (off-site disposal)

   b) polypropylene filters contaminated with nickel, zinc, tin, and copper (off-site disposal)

   c) the wastewater from the plating baths and rinse vats containing nickel, zinc, tin, and copper (recycled on-site)

Reply to: District 10/204-A W. 5th Street/ Odessa, TX 79761/915/332-51

Please update your registration by contacting the Texas Department of Water Resources (TDWR) Central Office (Austin)-Industrial Solid Waste Permits Division in reference to the above-mentioned. (Please refer to the attached copy of the notice of registration with the appropriate changes.) TAC Section 335.6

2) Failure to retain a copy of each shipping ticket required by TAC Section 335.10 for a minimum period of three years from the date of the shipment, and to prepare a monthly summary from the shipping tickets. Each monthly summary is to be submitted by the 25th day of each month, regardless of whether any shipments were made during the month. Copies of each monthly summary must be kept for a minimum of three years from the due date of the summary. TAC Section 335.13

3) Failure to submit an annual report to the Executive Director by January 21st of each year. The annual report must cover the facility activities pertaining to hazardous waste storage, processing, and disposal during the previous calendar year. TAC Sections 335.13 and 335.71

It is suggested that Nipco, Inc. apply for an infrequent shipper status with the Texas Department of Water Resources in order to gain exemption from the requirements outlined in items 2 and 3 listed above. In order to gain the infrequent shipper status, Nipco, Inc. must submit a letter of request to the TDWR Central Office (Austin) - Industrial Solid Waste Permits Division. The request should include evidence for infrequent shipping.

Should Nipco, Inc. obtain an infrequent shipper status, all procedures required for proper completion of the industrial waste shipping ticket apply; including the retention of a completed copy (maintained at the facility) for a minimum period of three years from the date of the shipment.

Information is requested by the District 10 office concerning previous storage and/or disposal of the process wastewater prior to installation of the recycling unit.

Please submit in writing in thirty (30) days to the District 10 office your actions to correct the outlined deficiencies.

Should you require assistance, please contact myself or Ms. Middleton at the District 10 office.

Sincerely,

William F. Lockey

William F. Lockey
District 10 Supervisor

WFL/JM:re

Attachment

cc Solid Waste and Spill Response Section

Checklist GENERATORS
(attach. to correct checkl.

Date 9-30-82

Reg./Permit No. SW31469

INDUSTRIAL SOLID WASTE

Compliance Monitoring Inspection Report

COMMENTS SHEET

SECTION: A Paragraph: 1

NIPCO HAS BEEN ACCUMULATING WASTE NICKEL SLUDGE IN PLASTIC BARRELS FOR OFF-SITE DISPOSAL. MR. FIELDS WAS INFORMED OF THE SHIPPING MANIFEST AND EPA GENERATOR IDENTIFICATION NUMBER REQUIREMENTS PRIOR TO SHIPMENT.

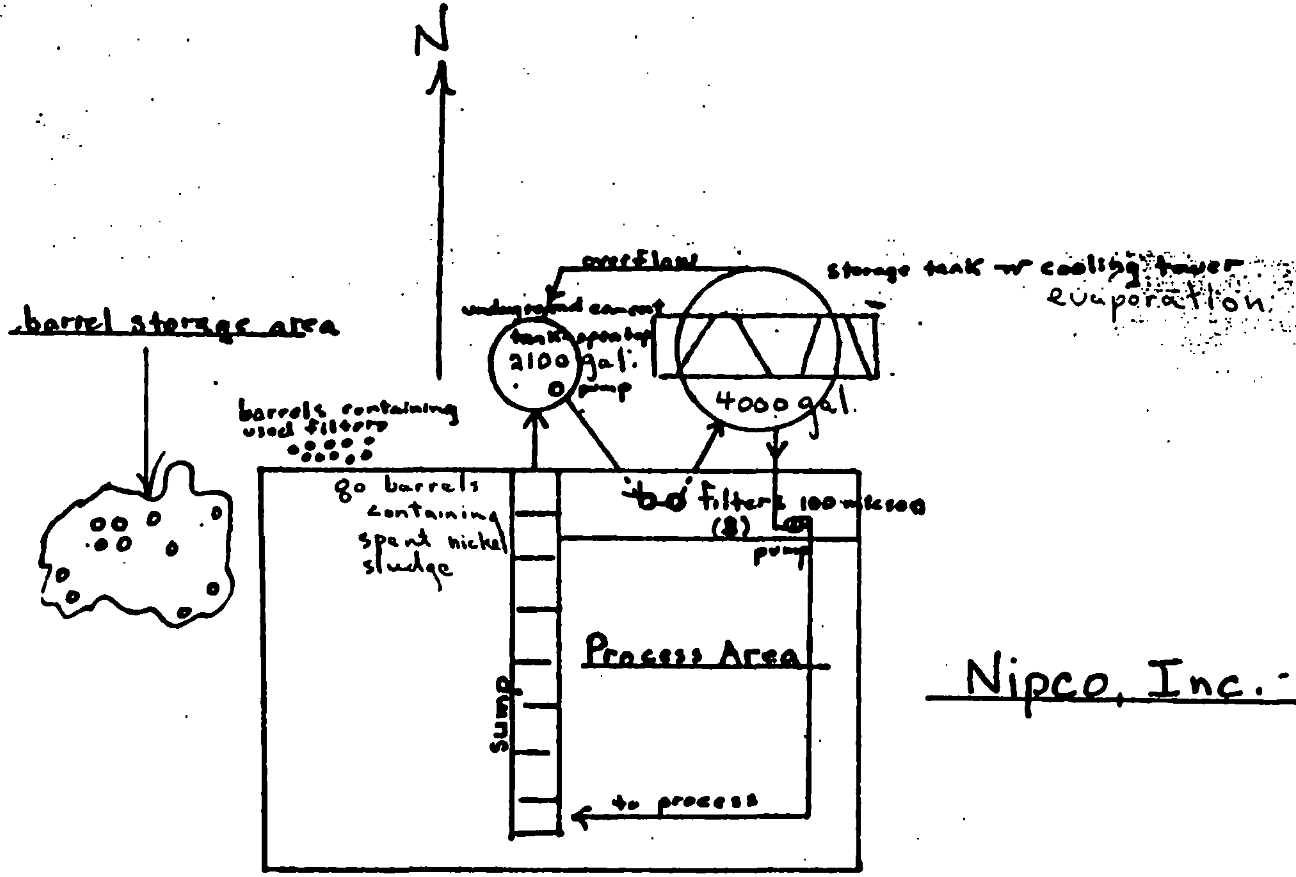
SECTION: B Paragraph: 2

METAL PLATING WASTES/SLUDGES INCLUDING NICKEL, TIN, ZINC, AND COPPER ARE GENERATED.

SECTION: Paragraph:

11 -022

11-023



Nipco, Inc. - Odessa, TX.

REFERENCE 12

Knowles, Nordstrom, and Klemt, Texas Department of Water Resources, "Evaluating the Ground-Water Resources of the High Plains of Texas," Volume 1, Report 288, May 1984, pp 2-4, 10, 13-14, 29-31, and Table 4.

TEXAS DEPARTMENT OF WATER RESOURCES

REPORT 288

EVALUATING THE GROUND-WATER RESOURCES OF THE HIGH PLAINS OF TEXAS

VOLUME 1

By

Tommy Knowles, Phillip Nordstrom,
and William B. Klemt

Prepared by the Texas Department of Water Resources in cooperation with the U.S. Geological Survey, High Plains Underground Water Conservation District No. 1, North Plains Ground Water Conservation District No. 2, Panhandle Ground Water Conservation District No. 3, and Texas Tech University

May 1984

12-001

ABSTRACT

A regional ground-water study of the High Plains aquifer was initiated in 1978 by the Texas Department of Water Resources. The study, partially funded by the U.S. Geological Survey, is to be included in that agency's eight-state study of the High Plains aquifer. Two primary purposes of the study were to improve the data base describing the aquifer and to develop a computer model capable of predicting future conditions. The High Plains of Texas covers about 35,000 square miles (91,000 km^2) and includes all or parts of 46 counties. The High Plains aquifer consists primarily of the Ogallala Formation, and includes all water-bearing units, mainly Cretaceous and Triassic sediments, with which it is in hydraulic continuity.

Approximately 14,000 data points were used to construct a detailed altitude to base of High Plains aquifer map. Water levels in over 3,800 wells were measured to provide a detailed 1980 water-level map. The comprehensive nature of these two maps provided a more accurate saturated thickness map than had previously been attained. Maps depicting specific yield and permeability were constructed based on lithologic descriptions, and the values derived were used in the digital model. The High Plains aquifer was determined to have an average specific yield of 16 percent and an average permeability of 400 gallons per day per square foot [16,300 (l/d)/m^2]. An average annual natural recharge rate of 0.2 inch (0.5 cm), or 371,910 acre-feet (457 hm^3), was applied to the entire aquifer.

A two-part digital model of the aquifer was constructed and calibrated for the period 1960 through 1980. In 1980, the aquifer contained 420.58 million acre-feet (519,000 hm^3) of water, 91.5 percent recoverable. The model was applied to predict the future conditions of the aquifer, with several runs made while varying the degree to which management practices reduce irrigation application rates. The following is a comparison between a model run with the largest reduction in application rates, showing improved management practices in force, and a run without a reduction of application rates.

For the year 2000, results of the model application which used reduced application rates are as follows: 363.46 million acre-feet (448,000 hm^3) of water in storage, 2.348 million acre-feet (2,900 hm^3) of annual net withdrawals, and 4.249 million acres (17,200 km^2) under irrigation. These values represent reductions from 1980 levels of 13.6, 50.4, and 7.4 percent, respectively. The year 2000 results of the model application that did not use reduced irrigation rates are 341.66 million acre-feet (421,000 hm^3) of water in storage, 3.913 million acre-feet (4,820 hm^3) of net withdrawals, and 3.940 million acres (15,900 km^2) under irrigation. The corresponding reductions from 1980 levels are 18.7, 17.4, and 14.1 percent, respectively.

For the year 2030, results of the model application which used reduced application rates are as follows: 310.66 million acre-feet (383,000 hm^3) of water in storage, 2.097 million acre-feet (2,590 hm^3) of annual net withdrawals, and 3.803 million acres (15,400 km^2) under irrigation. These values represent reductions from 1980 levels of 26.1, 55.7, and 17.1 percent, respectively. The results for the year 2030 of the model application that did not reduce application rates are 259.89 million acre-feet (320,000 hm^3) of water in storage, 2.385 million acre-feet (2,940 hm^3) of annual net withdrawals, and 2.628 million acres (10,600 km^2) under irrigation. The corresponding reductions from 1980 levels are 38.2, 49.6, and 42.7 percent, respectively.

12-002

TABLE OF CONTENTS

TABLE OF CONTENTS—Continued

12-004

TABLE OF CONTENTS—Continued

TABLES

FIGURES

TABLE OF CONTENTS—Continued

TABLE OF CONTENTS—Continued

12-008

TABLE OF CONTENTS—Continued

Page

Four additional reports were published during the course of this study. The reports discuss results of test hole drilling (Ashworth, 1980), results of surface electrical resistivity surveys (Muller, 1980), results of neutron-probe measurements (Klemt, 1981), and program documentation and user's manual for GWSIM-III computer program (Knowles, 1981).

Description of Project Area

The High Plains of Texas is the southernmost extension of the Great Plains physiographic province of North America which extends from the southern Texas Panhandle northward into South Dakota and includes parts of Colorado, Kansas, Nebraska, New Mexico, Oklahoma, and Wyoming. The High Plains of Texas covers about 35,000 square miles (91,000 km^2), and includes the Canadian River basin and the upper parts of the Red, Brazos, and Colorado River basins within the state. The study area, which averages about 300 miles (480 km) from north to south, and about 120 miles (190 km) from east to west, includes all or parts of Andrews, Armstrong, Bailey, Borden, Briscoe, Carson, Castro, Cochran, Crosby, Dallam, Dawson, Deaf Smith, Dickens, Donley, Ector, Floyd, Gaines, Garza, Glasscock, Gray, Hale, Hansford, Hartley, Hemphill, Hockley, Howard, Hutchinson, Lamb, Lipscomb, Lubbock, Lynn, Martin, Midland, Moore, Motley, Ochiltree, Oldham, Parmer, Potter, Randall, Roberts, Sherman, Swisher, Terry, Wheeler, and Yoakum Counties. The extent of the High Plains aquifer study is shown in Figure 1.

The Texas High Plains is essentially a flat plateau. A remarkable characteristic of the region is the great number of shallow depressions, or playas, which dot its surface. During periods of rainfall the playas accumulate drainage from local watershed areas ranging in size from less than one square mile to several square miles. Only a very small portion of the rainfall drains into the streams which traverse the plateau.

The Ogallala Formation of late Miocene to Pliocene age unconformably overlies Cretaceous, Jurassic, Triassic, and Permian rocks and consists primarily of sand, silt, clay, and gravel derived from the southern Rocky Mountains to the west. The Ogallala is the major water-bearing unit of the High Plains of Texas. Hydraulic continuity occurs between the Ogallala Formation and both the underlying Cretaceous, Jurassic, and Triassic rocks in many areas of the High Plains, and the Quaternary deposits, where present. Therefore, for the purpose of this study, the High Plains aquifer will be considered to consist of the saturated sediments of the Ogallala Formation and those geologic units which contain potable water and are in hydraulic continuity with the Ogallala.

Pleistocene and recent soils form a thin mantle over the Ogallala Formation. Caliche horizons, at depths ranging from 1 to 6 feet (0.30 to 1.80 m), underlie the top and subsoil zones over most of the Texas High Plains. These caliche zones are generally 1 to 2 feet (0.30 to 0.60 m) thick and grade downward into the lower Pleistocene subsoils or into hard indurated caliche layers (caprock) at the top of the Ogallala. The caprock in many cases separates the Pleistocene sediments from the Ogallala Formation. The topsoils consist of three major textural types: (a) fine sandy and silty loams, (b) clay and clay loams, and (c) fine sandy loams.

The High Plains consists of about 22 million treeless acres (91,000 km^2). A large part of this area is used for irrigation farming; the region is noted for its production of cotton, grain sorghums, and wheat.

12-D1D

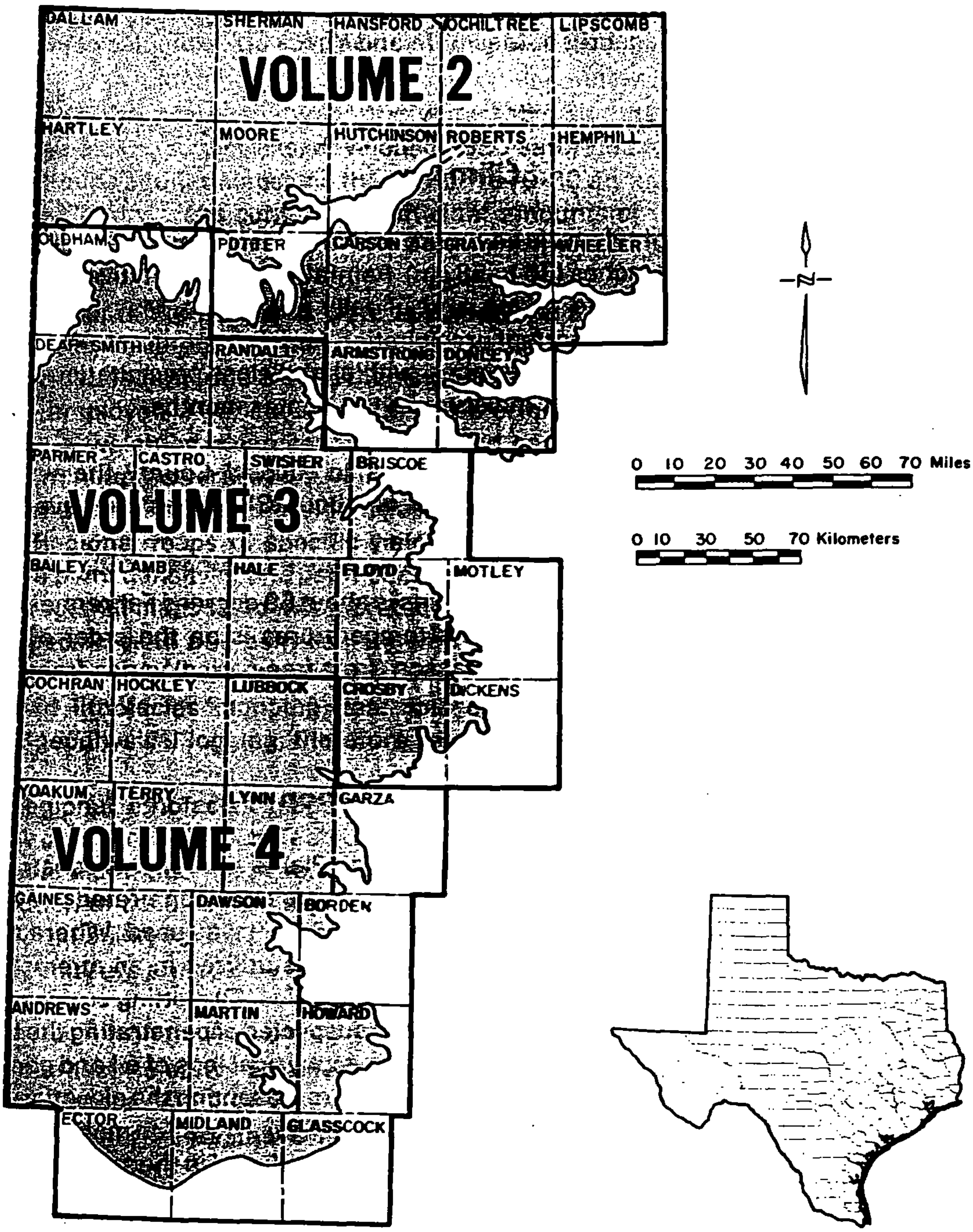


Figure 1
Extent of the High Plains Aquifer in Texas and Index to Volumes 2, 3, and 4

12-011

About one-half of the High Plains remains in grassland. Buffalo grass and Blue Grama are found on the clay and clay loam soils. On the sandy loam soils Little Bluestem, Western Wheat, Indian, Switch, and Sand Reed grasses are found. In other areas, the deep sands support thick growths of Shinoak and Sand Sagebrush. Mesquite and Yucca are examples of invading brushy plants.

Climate

The climate in the Texas High Plains is semiarid, and the mean annual precipitation over the area ranges from about 14 to 23 inches (36 to 58 cm). Rainfall is usually relatively light during the winter months, increasing during the spring and usually peaking in May. The average May precipitation is about three times the normal precipitation for a winter month. Average monthly precipitation reaches a second peak in September, with slightly less precipitation than the May peak. Snowfall is an important source of moisture in the winter months.

Evaporation is greatest during the summer months. In Lubbock County, the average annual evaporation potential for an open-water surface is about 3½ times the average annual precipitation.

The mean annual temperature for the High Plains is about 59 degrees Fahrenheit (15 °C). The average difference between summer and winter temperatures is on the order of 40 degrees Fahrenheit (22 °C). The length of the growing season (frost free period) varies from year to year but on the average is about 200 days.

Method of Investigation

The map showing the elevation of the base of the High Plains aquifer was constructed using drillers' logs and geophysical logs of water wells which completely penetrated the aquifer. For most of the study area, one data point per 2 square miles (5 km^2) was used. Where this density could not be attained with existing well logs, other data were utilized in an attempt to provide coverage. This supplemental work included (1) drilling test holes, (2) plotting surface contacts of the formation's outcrop, (3) geophysical logging of wells suspected of penetrating the base but for which drillers' logs were not available, and (4) utilizing geophysical logs of oil and gas test wells. The base map is a State of Texas Highway map and the lines representing the elevation of the base of the aquifer were drawn using a contour interval of 20 feet (6 m). A location map and a tabulation of all wells and data points used in the study were made and included in the study. Approximately 14,000 data points are included in the tabulation; however, thousands of supplemental points were also used in the base construction. The cooperating ground-water conservation districts developed the base of aquifer map, well-location map, and tabulation of all data used within their respective areas.

Water-level elevation maps for the years 1960, 1965, 1970, 1975, and 1980 were constructed utilizing measurements made from water-level observation wells in the High Plains area. The network presently contains over 3,800 wells, representing an average density of one well per 9 square miles (23 km^2). The coverage, however, is not uniform. The water-level measurements are usually taken during the winter months to minimize the effect of pumpage. The regional maps for 1960 through 1980 were prepared by Department personnel. Detailed county maps for 1980

Table 1.—Geologic Units and Their Water-Bearing Characteristics

System	Series	Group	Formation	Approximate maximum thickness (ft)	Physical character of rocks	Water-bearing characteristics
Quaternary	Pleistocene to Recent		Alluvium, eolian and lacustrine deposits	150	Windblown sand and silt, fluvial flood plain deposits, and silt and clay playa lake deposits.	Yields small amounts of water to wells.
Tertiary	Late Miocene to Pliocene		Ogallala	900	Tan, yellow, and reddish-brown, silty to coarse-grained sand mixed or alternating with yellow to red silty clay and variable sized gravel. Caliche layers common near surface.	Yields moderate to large amounts of water to wells. The principal aquifer in the study area with yields of some wells in excess of 1,000 gal/min.
Cretaceous	Gulf	Colorado	Graneros Shale	45	Dark-gray shale.	Not known to yield water to wells.
		Dakota	Dakota Sandstone	190	Tan to yellowish-brown, fine to medium-grained, thin to massive-bedded sandstone with interbedded gray shale.	Yields as much as 150 gal/min to irrigation wells in the northwest part of Dallam County.
	Comanche	Washita	Purgatoire	100	Upper member a dark-gray shale. Lower member a massive, buff to white, fine to coarse-grained, poorly cemented sandstone.	Yields as much as 500 gal/min to irrigation wells in the northwest part of Dallam County.
			Duck Creek	35	Yellow, sandy shale and thin gray to yellowish-brown, argillaceous limestone beds.	Not known to yield water to wells.
		Fredericksburg	Kiamichi	100	Thinly laminated, sometimes sandy, gray to yellowish-brown shale with interbeds of thin, gray, argillaceous limestone and thin, yellow sandstone.	Yields small amounts of water locally to wells.
			Edwards Limestone	40	Light-gray to yellowish-gray, thick bedded to massive, fine to coarse-grained limestone.	Locally yields moderate to large amounts of water to wells from fractures and crevices. / Yields small amounts of water to wells.
			Comanche Peak Limestone	55	Light-gray to yellowish-brown, irregularly bedded, argillaceous limestone and thin interbeds of light-gray shale.	Locally yields moderate to large amounts of water to wells from fractures and crevices. / Yields small amounts of water to wells.
			Walnut	25	Light-gray to yellowish-brown, fine to medium-grained, argillaceous sandstone; thin bedded, gray to grayish-yellow, calcareous shale; and light-gray to grayish-yellow, argillaceous limestone.	Not known to yield water to wells.
		Trinity	Antlers	125	White, gray, yellowish-brown to purple, fine to coarse-grained, argillaceous, loosely cemented sand, sandstone, and conglomerate with interbeds of siltstone and clay.	Yields small to moderate amounts of water to wells in the southern quarter of the study area.
Jurassic	Upper		Morrison	550	Grayish-green to red shale; white to brown, fine to coarse-grained sandstone; some clay, conglomerate, and limestone; brown-silt member at base.	Yields small amounts of water to livestock wells in north-central Dallam County.
			Exeter Sandstone	50	White to brown, massive, fine to medium-grained sandstone.	Yields as much as 20 gal/min to wells.
Triassic	Upper	Dockum	Undivided	2,000	Upper unit, Trujillo Formation, varicolored siltstone, claystone, conglomerate, fine-grained sandstone, and limestone. Lower unit, Tecovas Formation, varicolored, fine to medium-grained sandstone with some claystone and interbedded shale. Includes units equivalent to Chinle Formation and Santa Rosa Sandstone.	Yields small to moderate amounts of water to wells. Water quality variable with stratigraphic position and depth.
Permian	Upper		Undivided	1,000+	Very fine to fine-grained, red sandstone and shale; white to brown gypsum, anhydrite, and dolomite.	Yields small amounts of water to wells near the outcrop. Water quality generally slightly saline.

12-013

massive sandstone with a maximum thickness of approximately 50 feet (15 m). It grades up into the brown-silt member of the Morrison Formation.

The Exeter is a massive, white to buff, fine- to medium-grained sandstone which grades into a brown color near the contact with both the Morrison and Dockum beds. Locally, lenses of clay and gravel are present (Hart, Hoffman, and Goemaat, 1976, p. 17).

Yields of as much as 20 gal/min (1.3 l/s) can be obtained from wells in north-central Dallam County. Water quality is better when overlain directly by Tertiary deposits, but quality decreases as the overlying Morrison Formation thickens.

Morrison Formation

Underlying Tertiary or Cretaceous units in Dallam and Hartley Counties, as delineated by the Jurassic limit depicted on Figure 21, is the Morrison Formation of the Upper Jurassic Series. The Morrison overlies the Exeter Sandstone disconformably. Forming the basal unit of the Morrison is the brown-silt member, into which the underlying Exeter may grade (Baldwin and Muehlberger, 1959, p. 46). Sandstone beds occurring in the upper part of the Morrison contribute some water to wells where these beds are in direct contact with the Cretaceous Purgatoire Formation or the Tertiary Ogallala Formation. The relationship of the Ogallala, Cretaceous, and Jurassic strata in Dallam County can be seen on geologic section B-B' (Figure 23).

The Morrison Formation consists of varicolored shale dominated by gray-green and red, interbedded with white to brown, fine- to coarse-grained sandstone beds, locally thick. A persistent bed of brown silt occurs at the base of the Morrison. Strata of clay, marl, and conglomerate also occur at some locales.

Only small quantities of ground water are produced from domestic and livestock wells completed in the Morrison, and locations of most such wells are restricted to the north-central part of Dallam County. Chemical quality of ground water from Jurassic beds generally limits its usefulness. Thicknesses of up to 550 feet (168 m) have been documented in test holes drilled through the Jurassic into Triassic rocks.

Cretaceous System

Antlers Formation

The Trinity Group is represented by the Antlers Formation in the southern part of the High Plains study area. These rocks are considered to be equivalent to the Paluxy Sand of Central Texas, and are generally referred to as the "Trinity Sand" in the High Plains. The north-south limits of the Cretaceous occur where the sequence of Cretaceous rocks thins markedly or is absent in the subsurface due to erosion. In the Southern High Plains, isolated Cretaceous remnants occur north and south of these boundaries (Figure 2). The Antlers is underlain by an eroded surface of Triassic strata and overlain by Tertiary or other Cretaceous formations. Both boundaries exhibit an unconformable relationship.

Although absent in places, the Antlers forms a basal sand unit in the Cretaceous system in the southeastern and southern portions of the High Plains. It is a white to purple, loosely consolidated, fine- to coarse-grained, quartz sandstone, locally hard, and commonly interbedded with fine-grained yellow sand, green clay, and gray to pink siltstone. Scattered lenses of gravel occur throughout the unit, but a more persistent, basal conglomeratic unit with interbedded coarse sand is present in most sections. Ferruginous and calcareous cementation is common.

Small to moderate amounts of water can be pumped from wells completed in the Antlers Formation. Where a sufficient saturated thickness of Ogallala sediments overlies the Antlers, the well completion interval usually encompasses both formations. In Ector, Midland, and part of Glasscock Counties, the Antlers sand yields more water of acceptable quality than any other water-bearing formation, but because of relatively thin saturated thickness and low permeability, only moderate quantities of water can be obtained from individual wells. Well yields are usually less than 100 gal/min (6.3 l/s). Water from Cretaceous wells is only slightly more mineralized than water pumped from wells completed in the Ogallala. The High Plains aquifer includes the Trinity Group in Ector, Midland, and parts of Gaines, Andrews, Martin, and Glasscock Counties.

Locally, large quantities of water can be pumped from wells tapping fractures and crevices in the Fredericksburg Group limestones (Table 1) overlying the Antlers, but the dissimilar hydraulic characteristics and localized nature of this water source kept these formations from being included as part of the High Plains aquifer. Such large capacity wells were found in several areas, but were most extensive in Hale and Floyd Counties.

Purgatoire Formation

The Purgatoire Formation of the Washita Group underlies the Dakota Sandstone and unconformably overlies the Morrison Formation of Jurassic age (Table 1). Where the upper shale unit in the Purgatoire is absent, the Dakota and Purgatoire sandstones are contiguous and difficult to differentiate. For the purpose of this study, the Dakota Sandstone and Purgatoire Formation are referred to as Cretaceous rocks. In localized areas, water-bearing sandstone units of Upper Jurassic age in contact with the basal Purgatoire unit contribute sufficient quantities of ground water so as to be included in well completion intervals. The resulting Jurassic and Cretaceous rock combination shown on Figure 2 constitutes part of the High Plains aquifer, and all maps and sections of text referring to the High Plains aquifer make use of geologic and hydrologic data derived from wells completed in the Ogallala, Dakota, Purgatoire, Upper Jurassic, or any combination thereof. The extent of Purgatoire coincides with the extent of Dakota in Dallam County. The approximate thickness of the Purgatoire is 100 feet (30 m). Geologic section B-B' (Figure 23) further shows the subsurface position and net thickness of the Cretaceous and Jurassic rocks which contain the Purgatoire.

The upper unit of the Purgatoire consists of dark gray shale with thin sandstone ledges and is not water bearing. The lower unit is a buff to white, fine- to coarse-grained, poorly cemented, massive sandstone. Conglomerate beds are sometimes present in the basal part of the lower unit. The Purgatoire-Morrison contact is occasionally difficult to pick from geophysical logs in areas where sandstone beds occupy the upper interval of the Jurassic.

The primary source of water for irrigation wells in northwest Dallam County is the Purgatoire, with younger stratigraphic units (Ogallala and Dakota) also being included in well completions.

Ground-water movement is locally affected by pumpage. When a well is pumped, the water level is drawn down in the vicinity of the well, forming a cone of depression. The areal extent of this cone is dependent on rate and duration of pumpage, thickness of saturated strata above the pumping level, and the geohydrologic characteristics of the aquifer. The cone of depression formed by a pumping well or wells will change the hydraulic gradient within the influence of the cone, thus altering the rate and direction of movement.

Movement of ground water in the High Plains aquifer is also influenced by subsurface depositional environments. Buried drainage channels located throughout the study area provide passageways along which ground water more readily flows due to the higher permeability of the sediments filling the channels. These channels can be identified as basal troughs on the elevation of the base of aquifer map (Figure 20).

Hydraulic Characteristics

Results of Test Hole Core Analysis

The hydraulic characteristics of the High Plains aquifer were studied during an extensive test hole drilling project that was conducted by the Department (Ashworth, 1980). Cores retrieved from 41 test holes (Figure 7) were analyzed for porosity, specific yield, permeability, and grain-size distribution. Laboratory analyses were conducted on cores taken from the saturated zone, and therefore, the following results should not be considered indicative of the entire formational thickness.

The core analyses indicate that transmissivities range from 315 to 201,000 gallons per day per foot [3,910 to 2.496 million (l/d)/m], with an overall average of 30,400 (gal/d)/ft [377,500 (l/d)/m]; permeabilities range from 22 to 1,934 gallons per day per square foot [900 to 78,800 (l/d)/m^2], with an overall average of 232 (gal/d)/ft^2 [9,450 (l/d)/m^2]; and specific yield ranges from 7.23 to 19.54 percent, with an overall average of 16.06 percent. Figure 8 shows the relationship between porosity and specific yield as determined from the test cores.

A statistical analysis of data was undertaken to determine the weighted mean position or center of gravity (first moment), and the average dispersion or standard deviation (second moment) of transmissivity and specific yield throughout the saturated thickness of each test hole. The calculations indicate that the center of gravity occurs about midway in the saturated interval, and the standard deviation indicates a lack of concentration about the center of gravity. The results of these calculations for each test hole are shown in Table 4. Permeability and specific yield thus appear to be evenly distributed throughout the saturated zone.

Permeability versus depth for each test hole was plotted in an attempt to determine if permeability would increase with depth at a predictable rate as does median grain size over most of the study area. No predictable slope to the plots could be ascertained. An explanation for this lack of trend probably lies in the mode of deposition of the Ogallala. The initial deposits, composed of gravel and coarse sands and often intermixed with silts and clays, represent a high energy environment in which poor sorting, and thus retarded permeability, prevails. Sorting conditions generally improve upward in the formation along with decreasing grain size as a result of less energy involvement in deposition. No clear relationship enfolded between permeability and depth within the Ogallala Formation.

12-016

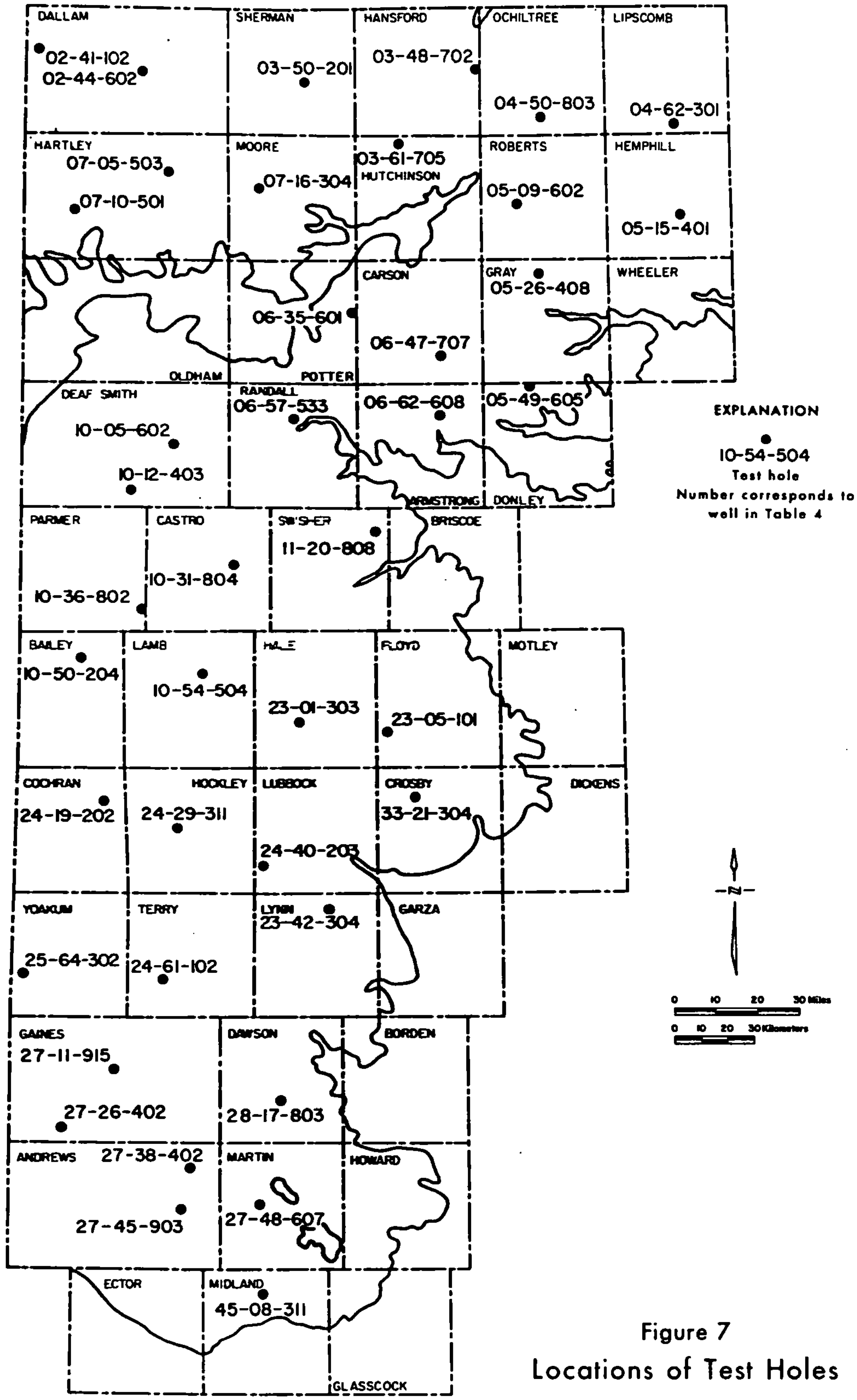


Figure 7
Locations of Test Holes

Base adapted from U.S. Geological Survey, 1965

12-D17

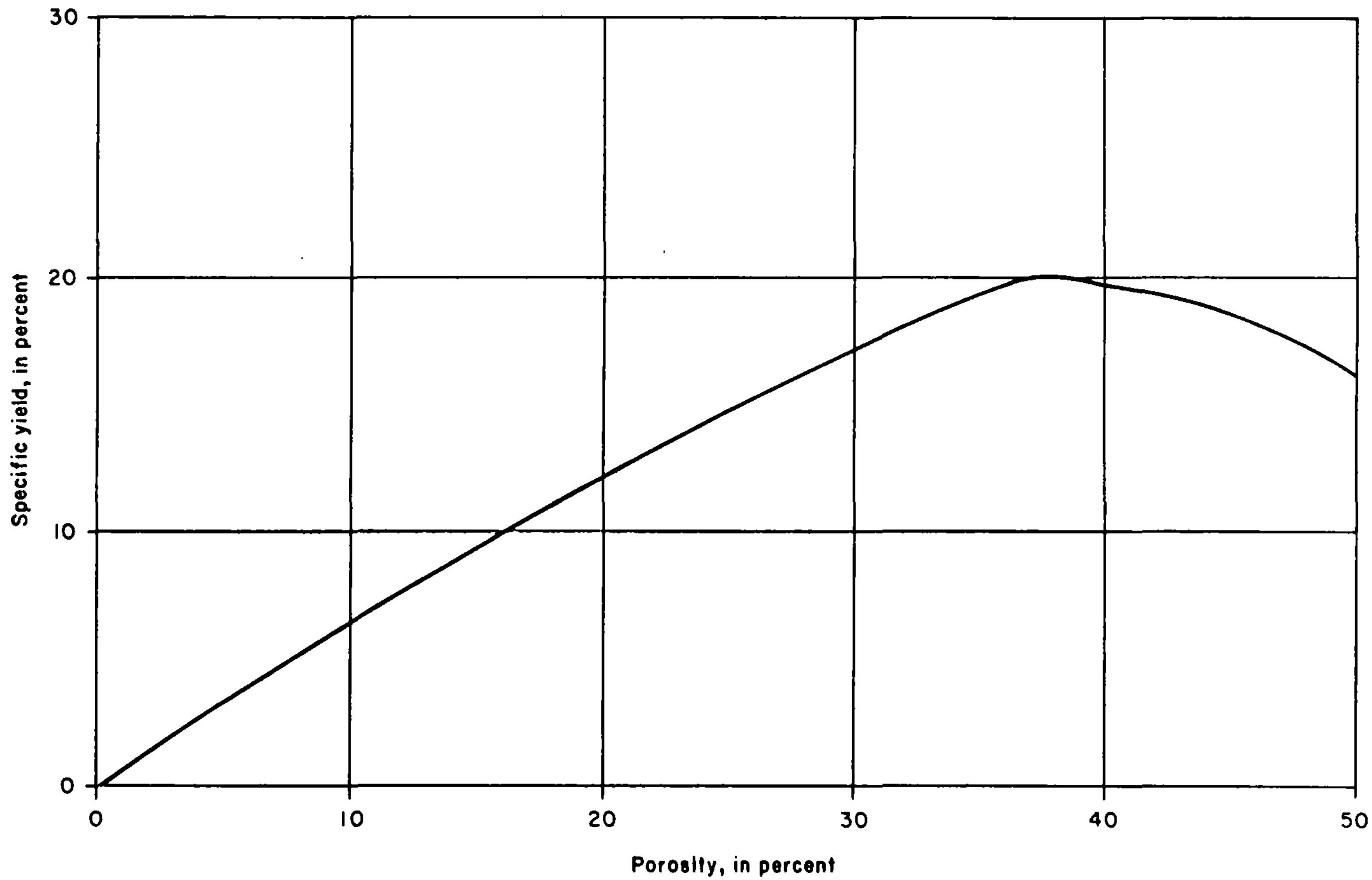


Figure 8
Specific Yield and Porosity From High Plains Aquifer Cores

Table 4
Results of Lithologic, Geophysical, and Laboratory Data Analysis

Well	County	North latitude ° ′ ″	West longitude ° ′ ″	Surface elevation (feet)	Depth (feet)	Depth to base of aquifer (feet)	Elevation of base of aquifer (feet)	Depth to static water level (feet)	Elevation of static water level (feet)	Saturated thickness (feet)	Transmissivity T[1,2] [(gal/d)/ft]	Average specific yield Sy[1,2] (percent)	1st Moment T[1,2] (percent)	2nd Moment T[1,2] (percent)	1st Moment Sy[1,2] (percent)	2nd Moment Sy[1,2] (percent)	Average[1] permeability [(gal/d)/ft²]	Clastic ratio[1] gravel+sand / gravel+sand+clay	Lithofacies type[1,3]	Remarks
27-38-402	ANDREWS #1	32 28 07	102 30 37	3,026	125	119	2,907	73	2,953	46	41,353	18.02	53	19.43	50	26.68	984	.90	A	
27-43-903	ANDREWS #2	32 17 24	102 33 19	3,039	121	115	2,924	63	2,976	62	7,894	7.23	10	17.23	33	33.28	127	.83	—	40 ft to 115 ft Cretaceous
06-42-808	ARMSTRONG	35 04 25	101 15 55	3,344	316	310	3,034	250	3,094	60	2,295	13.98	66	35.74	68	36.08	38	.74	D	
10-50-204	BAILEY	34 14 36	102 49 02	3,831	200	180	3,651	85	3,746	95	7,610	18.37	51	25.92	49	27.78	80	.95	C	
06-47-707	CARSON	35 16 50	101 14 21	3,362	518	490	2,872	320	3,042	170	50,173	18.43	29	16.65	49	14.99	236	.86	A	
10-31-804	CASTRO	34 33 21	102 19 11	3,785	250	242	3,443	240	3,545	102	9,498	18.63	64	23.39	63	38.85	93	.89	A	
24-19-202	COCHRAN	33 43 10	102 41 03	3,711	290	265	3,446	149	3,562	118	38,268	16.97	38	18.07	50	34.64	313	.97	A	
23-21-304	CROSBY	33 44 34	101 34 38	3,120	360	340	2,780	208	2,912	132	17,274	17.55	54	16.56	54	26.28	131	.87	C	
02-44-402	DALLAM #1	36 17 42	102 22 12	4,130	432	445	3,685	265	3,865	190	5,069	11.63	52	33.69	56	30.80	28	.67	—	280 ft to 443 ft Triassic
02-41-102	DALLAM #2	36 21 03	102 59 29	4,560	310	302	4,258	120	4,440	182	12,747	19.12	50	24.02	51	28.49	70	.87	—	133 ft to 302 ft Cretaceous 302 ft to 310 ft Jurassic
23-17-603	DAWSON	32 39 29	101 56 05	2,940	185	183	2,757	80	2,860	103	29,968	18.83	79	29.83	48	29.09	291	.78	A	178 ft to 183 ft Cretaceous
10-05-602	DEAF SMITH #1	34 57 28	102 24 08	3,888	430	411	3,477	152	3,736	259	74,633	19.54	57	22.46	56	23.59	95	.94	C	
10-12-403	DEAF SMITH #2	34 49 30	102 36 10	3,952	240	230	3,722	195	3,757	35	2,100	15.00	50	25.61	50	25.61	60	.89	B	
05-49-605	DONLEY	35 10 57	100 54 25	3,195	640	620	2,575	310	2,885	310	68,534	15.00	56	20.07	49	29.54	221	.83	A	
23-06-101	FLOYD	33 57 45	101 29 45	3,223	436	425	2,798	187	3,036	238	17,278	14.17	51	29.97	48	28.80	73	.88	D	
27-28-402	GAINES #1	32 33 17	102 51 07	3,400	230	224	3,176	157	3,243	67	7,919	14.98	61	38.79	46	29.38	118	.82	B	
27-11-915	GAINES #2	32 48 35	102 38 22	3,324	120	98	3,226	—	—	0	—	—	—	—	—	—	—	—	—	No water encountered
06-28-608	GRAY	35 22 04	100 50 34	3,182	540	525	2,657	360	2,822	165	6,036	19.26	60	18.10	61	28.50	49	.93	C	
23-01-303	HALE	33 59 34	101 52 45	3,410	342	328	3,082	175	3,235	153	38,176	18.67	55	22.28	61	25.46	250	.94	A	
03-45-703	HANSFORD	36 15 37	101 05 35	3,076	690	662	2,414	345	2,731	317	200,867	18.85	47	7.61	50	13.18	634	.96	A	
07-10-507	HARTLEY #1	35 48 55	102 49 32	4,085	400	385	3,700	175	3,910	210	15,470	17.62	65	23.13	65	25.77	74	.81	B	
07-08-803	HARTLEY #2	35 58 29	102 25 10	3,928	500	462	3,466	375	3,553	67	82,179	18.60	40	16.69	50	27.05	600	.95	A	
05-15-401	HEMPHILL	35 47 37	100 14 11	2,560	390	330	2,230	143	2,417	187	80,878	18.40	58	19.84	50	28.51	272	.87	A	
24-29-311	HOCKLEY	33 35 44	102 34 35	3,540	204	178	3,362	146	3,394	32	704	15.00	50	0	50	0	22	.92	A	
03-61-705	HUTCHINSON	35 50 30	101 27 43	3,180	382	344	2,836	75	3,105	269	12,368	8.23	41	18.21	40	23.51	46	—	B	
10-54-504	LAMB	34 11 01	102 18 21	3,657	338	314	3,343	100	3,557	214	31,957	14.50	28	23.03	45	27.84	149	.95	B	
04-43-301	LIPSCOMB	36 05 53	100 16 35	2,682	535	440	2,242	118	2,564	322	47,877	15.08	53	25.11	62	20.80	149	.82	D	
24-40-203	LUBBOCK	33 33 35	102 03 10	3,320	210	206	3,114	141	3,179	63	47,970	17.00	50	0	50	0	738	.94	A	
23-43-304	LYNN	33 20 07	101 45 30	3,138	115	112	3,026	103	3,035	9	1,224	17.00	50	0	50	0	138	.95	A	
27-48-627	MARTIN	32 18 10	102 02 14	2,822	191	185	2,637	138	2,684	47	80,900	18.00	49	23.68	50	22.69	1,934	.93	A	
45-08-311	MIDLAND	31 59 41	102 02 10	2,746	91	79	2,678	63	2,685	7	318	10.00	50	0	50	0	45	.98	D	
07-16-304	MOORE	35 51 57	102 01 13	3,689	640	645	3,044	307	3,382	333	22,350	13.92	56	23.30	56	20.30	94	.87	—	430 ft to 600 ft Triassic
04-50-803	OCHILTREE	36 08 23	100 49 13	2,982	640	580	2,392	310	2,672	280	21,301	15.90	36	29.07	46	27.23	76	.83	A	
10-36-602	PARMER	34 23 00	102 33 06	3,886	372	366	3,520	218	3,668	148	19,818	16.78	37	28.37	47	27.83	132	.83	C	
06-35-601	POTTER	35 13 05	101 39 05	3,477	690	665	2,812	320	3,157	345	56,823	18.47	41	29.34	50	28.44	165	.83	A	
06-57-533	RANDALL	35 03 29	101 56 05	3,647	270	270	3,377	177	3,470	93	2,427	10.91	53	25.58	51	28.92	26	.92	B	
05-09-802	ROBERTS	35 49 28	100 54 40	2,942	490	468	2,474	120	2,822	348	25,138	14.03	39	25.05	55	29.87	72	.92	D	
03-30-301	SHERMAN	36 14 15	101 49 23	3,657	580	657	3,000	187	3,310	310	72,063	18.17	41	30.65	63	27.38	233	.88	A	
11-30-808	SWISHER	34 39 23	101 33 45	3,369	223	176	3,193	78	3,291	98	3,354	17.95	57	35.65	53	25.68	34	.94	B	
24-61-102	TERRY	33 05 39	102 27 47	3,371	115	97	3,274	—	—	0	—	—	—	—	—	—	—	—	—	No water encountered
25-64-302	YOAKUM	33 06 41	103 01 01	3,745	181	167	3,578	83	3,662	84	9,840	17.77	57	11.38	58	15.16	117	.96	C	

[1]Determined in saturated zone only.
[2]T = Transmissivity, Sy = Specific yield.
[3]Lithofacies type designations:
A—Fluvial channel
B—Interdistributary
C—Distributary mouth fan
D—Proximal fan slope

12-019

REFERENCE 13

Record of Telephone Conversation, From: Mengistu Lemma, Fluor Daniel, Inc., To: Andy Biasco, Nipco Inc., Status/Number of Employees at the Nipco Site, 13 September 1994.

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

From:	Mengistu Lemma	**Date:**	09/12/94
Location:	Fluor Daniel - Dallas	**Time:**	10:45
To:	Andy Biasco	**Phone No.:**	(915) 362-7211
Location:	Nipco Inc.	**Other Ref.:**	06683440
Subject:	Status/Number of Employees at the Nipco Site		

I talked to Andy Biasco, an employee of Nipco, Inc. He told me the site is still active and there are 12 employees working at the site.

He also told me that he would classify the area where the site is located as a mixed industrial and residential area.

REFERENCE 14

Record of Telephone Conversation, From: Allan Seils, SSDAT, To: Rod Lewis, CRMWD, Ground Water Well Population Information, February 1992.

TELEPHONE MEMO TO THE FILE

Call To: Rod Lewis
Colorado River Municipal Water District

Call From: Allan Seils
SSDAT

Date of Call: 02/18/92

File No.: N/A

Phone No.: (915) 267-6341

Subject: Machine and Casting, Inc.

Ground Water Well and Population Information

Information for File: Mr. Lewis provided information on which wells are active and inactive in the City of Odessa public water supply system. He reported that CRMWD uses 26-30 wells producing a total of 1 million gpd from mid-May to the end of September. The water from these wells go to a storage reservoir where it is blended with 15 million gpd of surface water from E.V. Spence and J.B. Thomas Lakes.

Signed: Allan W Seils

This Document Contained Material Which Was Not Filmed/Scanned

Title Reference 14 Record of Telephone Conversation, From: Allan Seil, SSDAT, To: Rod Lewis, CRMWD Ground Water Well Population Information, February 1992 (Alternative Media)

Please Refer to the File in Superfund Records Center